

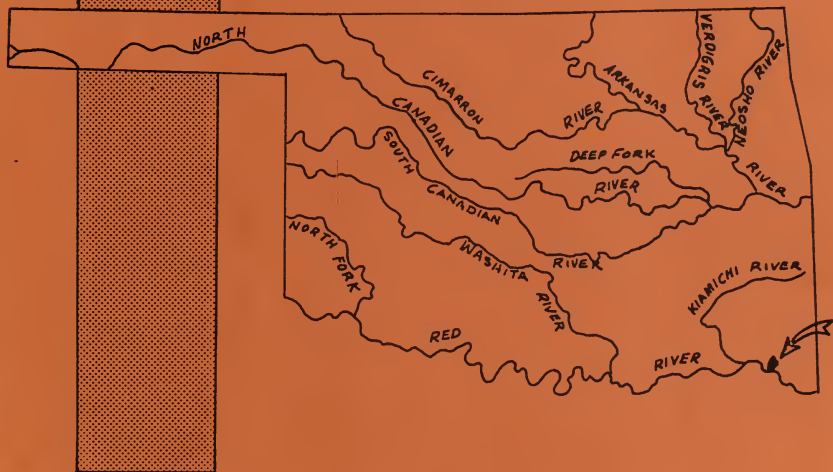
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WATERSHED PLAN  
and  
ENVIROMENTAL IMPACT STATEMENT  
for  
MCKINNEY-BUZZARD WATERSHED

MCCURTAIN COUNTY, OKLAHOMA



PREPARED UNDER THE AUTHORITY OF THE WATERSHED PROTECTION  
AND FLOOD PREVENTION ACTS.

(PUBLIC LAW 566, 83rd CONGRESS, 68 STAT. 666), AS AMENDED

Prepared by: McKinney-Buzzard Conservancy District  
Valliant Conservation District

With Assistance By:

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
FOREST SERVICE  
APRIL 1976

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FINAL PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT

MCKINNEY-BUZZARD CREEK WATERSHED  
McCurtain County, Oklahoma

Prepared Under the Authority of the Watershed  
Protection and Flood Prevention Act (Public  
Law 566, 83rd Congress, 68 Stat. 666) as amended,  
and in accordance with the National Environmental  
Policy Act of 1969, Section 102(2)(C) Public Law  
91-190.

Prepared by: McKinney-Buzzard Conservancy District  
(Sponsor)

Valliant Conservation District  
(Sponsor)

With Assistance By:

U. S. Department of Agriculture, Soil Conservation Service

U. S. Department of Agriculture, Forest Service

U. S. Department of Interior, Bureau of Indian Affairs

December 1975



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## INTRODUCTION

The Watershed Plan, Part I, has been briefed to avoid excessive duplication with information required for the Environmental Impact Statement, Part II. The watershed plan includes the details about the installation costs, monetary benefits, the project map, comparison of benefits and costs, provisions for installation of the project measures, provisions for operation and maintenance of the project measures, financing the project, various tables containing technical information, and information required by various federal regulations.

The Environmental Impact Statement should be consulted for detailed information and description of the planned project, alternatives, the environmental setting of the watershed, water and related land resource problems, and the effects of the project measures which are to be installed.



WATERSHED PLAN AGREEMENT

between the

McKinney-Buzzard Conservancy District  
Local Organization

Valliant Conservation District  
Local Organization

(hereinafter referred to as the Sponsoring Local Organization)

State of Oklahoma

and the

Soil Conservation Service  
United States Department of Agriculture  
(hereinafter referred to as the Service)

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsoring Local Organization for assistance in preparing a plan for works of improvement for the McKinney-Buzzard Creek Watershed, State of Oklahoma, under the authority of the Watershed Protection and Flood Prevention Act (P.L. 566, 83rd Congress; 68 Stat. 666), as amended; and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the Service; and

Whereas, there has been developed through the cooperative efforts of the Sponsoring Local Organization and the Service a mutually satisfactory plan for works of improvement for the McKinney-Buzzard Creek Watershed, State of Oklahoma, hereinafter referred to as the watershed plan, which plan is annexed to and made a part of this agreement;

Now, therefore, in view of the foregoing consideration, the Sponsoring Local Organization and the Secretary of Agriculture, through the Service, hereby agree on the watershed plan, and further agree that the works of improvement as set forth in said plan can be installed in about 5 years.

It is mutually agreed that in installing and operating and maintaining the works of improvement substantially in accordance with the terms, conditions, and stipulations provided for in the watershed plan:



1. The Sponsoring Local Organization will acquire, with other than PL-566 funds, such land rights as will be needed in connection with the works of improvement. (Estimated Cost \$188,500).
2. The Sponsoring Local Organization assures that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. The costs of relocation payments will be shared by the Sponsoring Local Organization and the Service as follows:

	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimated Relocation Payment Costs</u> (dollars)
Relocation Payments	50.71	49.29	0 <u>1/</u>

1/ Investigation has disclosed that under present conditions the project measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost-shared in accordance with the percentages shown.

3. The Sponsoring Local Organization will acquire or provide assurance that landowners or water users have acquired such water rights pursuant to state law as may be needed in the installation and operation of the works of improvement.
4. The percentages of construction costs of structural measures to be paid by the Sponsoring Local Organization and by the Service are as follows:

<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimated Construction Cost</u> (dollars)
Structure No. 1	0	100.0	180,000
Channel Work	6.27	93.73	169,100

5. The percentages of the engineering costs to be borne by the Sponsoring Local Organization and the Service are as follows:



<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimated Engineering Costs</u> (dollars)
Structure No. 1	0	100	19,000
Channel Work	0	100	18,500

6. The Sponsoring Local Organization and the Service will each bear the costs of Project Administration which it incurs, estimated to be \$10,500 and \$79,000 respectively.
7. The Sponsoring Local Organization will obtain agreements from owners of not less than 50 percent of the land above each reservoir and flood water retarding structure that they will carry out conservation farm or ranch plans on their land.
8. The Sponsoring Local Organization will provide assistance to landowners and operators to assure the installation of the land treatment measures shown in the watershed plan.
9. The Sponsoring Local Organization will encourage landowners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.
10. The Sponsoring Local Organization will be responsible for the operation and maintenance of the structural works of improvement by actually performing the work or arranging for such work in accordance with agreements to be entered into prior to issuing invitations to bid for construction work.
11. The costs shown in this agreement represent preliminary estimates. In finally determining the costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.
12. This agreement is not a fund obligating document. Financial and other assistance to be furnished by the Service in carrying out the watershed plan is contingent on the availability to appropriations for this purpose.  
  
A separate agreement will be entered into between the Service and the Sponsoring Local Organization before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
13. The watershed plan may be amended or revised, and this agreement may be modified or terminated only by mutual agreement of the





parties hereto except for cause. The Service may terminate financial and other assistance in whole, or in part, at any time whenever it is determined that the Sponsoring Local Organization has failed to comply with the conditions of this agreement. The Service shall promptly notify the Sponsoring Local Organization in writing of the determination and the reasons for the termination, together with the effective date. Payments made to the Sponsoring Local Organization or recoveries by the Service under projects terminated for cause shall be in accord with the legal rights and liabilities of the parties.

14. No member of or delegate to congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
15. The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 C.F.R. 15.1-15.12), which provide that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance.
16. This agreement will not become effective until the Service has issued a notification of approval and authorizes assistance.



McKinney-Buzzard Conservancy Dist. By Joe C. Herron

Local Organization

Title Chairman

P.O. Box 480, Valliant, Okla. 74764

Address

Date 4 - 21 - 76

The signing of this agreement was authorized by a resolution of the governing body of the McKinney-Buzzard Conservancy District

Local Organization

adopted at a meeting held on 4 - 21 - 76

Harold E. Hess  
Secretary, Local Organization

P.O. Box 480, Valliant, Okla. 74764  
Address

Date 4 - 21 - 76

Valliant Conservation District

Local Organization

By J. J. Hany

Title Chairman

P.O. Box 480, Valliant, OK 74764

Address

Date 4 - 19 - 76

The signing of this agreement was authorized by a resolution of the governing body of the Valliant Conservation District

Local Organization

adopted at a meeting held on 4 - 19 - 76

Capitola M. Rich  
Secretary, Local Organization

P. O. Box 480, Valliant, Okla. 74764  
Address

Date 4 - 19 - 76

Appropriate and careful consideration has been given to the environmental statement prepared for this project and to the environmental aspects thereof.

Soil Conservation Service  
United States Department of Agriculture

Approved by:

Robert E. Sills  
State Conservationist

4/22/76

Date



## WATERSHED PLAN

McKINNEY-BUZZARD CREEK WATERSHED  
McCurtain County, Oklahoma  
December 1975

### SUMMARY OF PLAN

McKinney-Buzzard Creek Watershed drains 15,980 acres (24.97 square miles) in extreme southeastern Oklahoma. The works of improvement in the plan will include land treatment measures, a single-purpose flood-water retarding structure, and about 9.20 miles of multipurpose channel work with appurtenant structures.

The proposed plan can be installed within five years after approval for construction. The total project cost is estimated to be \$939,420. Of this amount, \$463,000 will come from PL-566 funds and \$476,420 will come from other sources.

The total average annual benefits resulting from the installation of structural measures are estimated to be \$59,810. Of this total, \$45,300 in benefits will accrue directly to agriculture.

The average annual cost of structural measures is \$42,113. The installation of these measures is expected to produce average annual primary benefits of \$48,870. The total benefits from structural measures, including external economies, amount to \$59,810 and provide \$1.42 for each dollar of costs.

The completed project will reduce erosion and flooding, increase crop yields and net returns of low income operators. It will create employment opportunities and protect the lives of travelers, campers, and fishermen. Stream base flows will be prolonged, turbidity and sediment yield reduced, and water quality improved. About 51 acres of new high quality water habitat will be created and the population of ground nesting animals in the flood plain will become more permanent and stable. The project will also reduce land available for agricultural production by about 100 acres and restrict the use of another 444 acres. It will decrease woodland wildlife habitat and temporarily disrupt wildlife habitat during construction. Localized short-term increases in erosion, turbidity, sediment, noise, and dust will occur during construction. Streamflow leaving the watershed will be decreased about 1.75 percent.

The Soil Conservation Service, through the Conservation District, is giving technical assistance in the planning and application of these measures. The Bureau of Indian Affairs will assist with land rights on structures which affect Indian land under their jurisdiction. They will, through their operating units, give technical assistance in the

planning and application of land treatment measures under their going program. Technical assistance for forestland measures will be provided by the Oklahoma Forestry Division in cooperation with the U. S. Forest Service under the going Cooperative Forest Management Programs.

The local sponsor will provide, at no cost to the federal government, all the land rights, easements, and relocation or modification of roads, utilities, pipelines, and other improvements as needed for the construction of the floodwater retarding structure. Technical assistance will be provided by the Service in the preparation of contract payment estimates, final inspection, execution of certificates of completion, and related tasks for the establishment of the structures. The local sponsoring organization has formally requested the Soil Conservation Service to do the contracting for all structural measures.

The structural measures will be operated and maintained jointly by the McKinney-Buzzard Creek Conservancy District and the Valliant Conservation District. A three-year establishment period is prescribed after completion of the structural measures. Provisions are made for periodic joint inspections by Service and sponsor representatives during this three-year period. After the third year, the Sponsors will make periodic inspections and provide a copy of the inspection report to the Service.

Federal assistance for carrying out the works of improvement described in this plan will be provided under the authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83rd Congress, 68 Stat. 666) as amended. The non-federal part of the cost of installing the project will be met largely by donations of land rights, material, labor, equipment, services, and money. If money obtained from contributions, state revolving funds, county and local funds prove to be inadequate, the amount of additional funds needed to finish the project will be estimated and an application may be made to borrow these funds from the Farmers Home Administration. The Sponsors understand their obligations and expected expense, and are prepared to carry out their part of the project installation.

## PLANNED MEASURES

This project is planned to solve the problems discussed in the Project Purposes and Goals section of the EIS. It is estimated that the structural measures will be completed within a five-year period.

### 1. Land Treatment Measures

About 1,900 acres of cropland, 3,700 acres of tame pasture, 1,350 acres of native rangeland, and 100 acres of forestland are scheduled for land treatment during the project installation period.

Conservation land treatment includes measures designed to function as a system in establishing good land cover and soil condition. These measures decrease erosion damage and sediment yields. Each practice is effective by itself. However, the total land treatment system is more effective in reducing erosion. Each system is different, depending on the specific requirements of the land it covers.

Cropland treatment measures would include conservation cropping systems (use of diversified crops in rotation and management of residues), grassed waterways, terraces, and contour tillage. Grassland treatment includes such measures as proper use (grazing so as to leave enough residue to prevent erosion), range seeding, pasture planting, critical area treatment, and wildlife habitat development. Treatment of forestland includes timber stand improvement measures.

### 2. Structural Measures

#### a. Reservoir type structures.

One single-purpose floodwater retarding structure will be installed on Buzzard Creek to protect flood plain land that cannot be adequately protected by land treatment measures alone (see Project Map). The drainage area of the proposed structure comprises 48 percent of the watershed. The structure will have a total floodwater detention capacity of 4,146 acre-feet and will temporarily detain 6.51 inches of runoff. The structure is planned to temporarily detain the direct runoff from a 36-year frequency, 10-day storm period.

The structure will involve the use of an earthfill embankment. Preliminary geologic investigations made on the proposed site indicates that sufficient borrow material is available in the sediment pool area. No additional land rights will be needed as a source for borrow material.

Provision is made at this site for 100-year sediment storage. The crest of the principal spillway will be set at the 50-year sediment storage elevation. Storage of water to the 100-year sediment storage elevation may be allowed where water rights are obtained to add the second 50-year sediment storage. 1/

b. Channels.

About 9.20 miles of multipurpose channel work with appurtenant structures are planned for the McKinney Creek portion of the watershed (see Project Map). The channel work consists of one main channel and six laterals. 2/ The main channel is about 5.84 miles in length. The laterals vary from 0.17 miles to 1.23 miles and have a combined length of 3.36 miles.

Of the 5.84 miles of main channel, about 800 feet will be in a previously modified channel, and about 0.5 miles will be a new channel where the natural channel will be straightened in Reach 1. The remainder of the work will occur along the natural channel. One 1,600-foot segment of one of the laterals has been previously constructed by a landowner, about 0.6 miles will follow the natural channel, and the remaining 2.4 miles does not have a clearly defined channel. The entire creek is classed as an ephemeral stream with the exception of a 1,000-foot section where water is ponded intermittently.

Roads and rights-of-way will be provided so that all parts of the channel will be accessible for maintenance purposes. The location of these maintenance roads will be shown on the land rights map.

A total of 29 grade stabilization structures will be included in the channel system. All of these will be corrugated metal pipe drop structures except the one at the outlet, and most will be located where drainageways enter the deepened main channel.

Tables 3 and 3A present physical data about the structural measures.

c. Other

Wildlife mitigation measures include installation of a minimum of 10 wood duck nesting boxes, 30 squirrel nesting containers, and strip plantings along McKinney Creek channel comparable in extent and quality to habitat destroyed by channel construction. Maintenance of these measures will be the responsibility of the sponsoring local organizations.

1/ Refer to Oklahoma Water Resources Board Resolution of January 10, 1961.

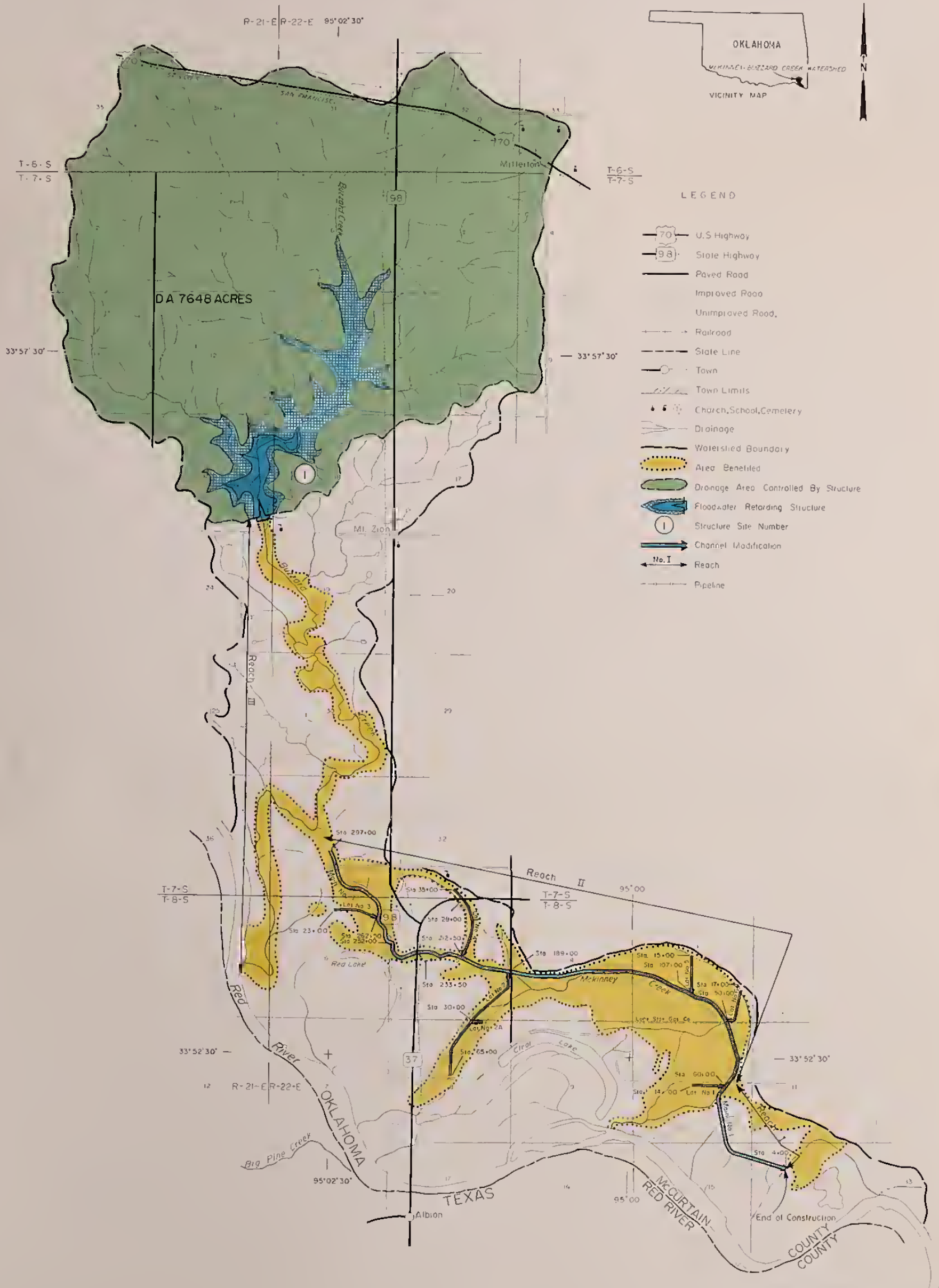
2/ Main channel (No. 1); and six laterals (Nos. 1,2,2A,3,5, and 6).



The local sponsors will also be responsible for necessary rebuilding or modification of roads, bridges, and utilities involved in structural measures. These include one pipeline and three bridges in the main channel and one pipeline in the flood-water retarding structure.

Potential for low intensity recreational use of the flood-water retarding structure was recognized and discussed with local sponsors. Public access to this area is not provided for in this plan. Land rights agreements with individual landowners will stipulate that if, in the future, public access to this site is allowed, sanitary facilities approved by the Oklahoma State Health Department will be provided.





PROJECT MAP  
MC KINNEY-BUZZARD CREEK WATERSHED  
PORTION OF  
MC CURTAIN COUNTY, OKLAHOMA

APPROXIMATE SCALE 1"=1 MILE

DATA Compiled from Unclassified Watershed  
No. 1 & 2132 U.S. & S. Maps and County  
Highway, Top  
ographic and County Maps 1911, 1907, 1904, 1901

REVISED MARCH 1976  
SEPTEMBER 1968

4-R-33429  
4-R-27108



### INSTALLATION COSTS - MONETARY

Installation costs of planned land treatment measures are estimated to be \$274,820 (Table 1).

Installation costs of the structural measures will total \$664,600. The construction costs include the engineer's estimate, contingency allowance, and wildlife plantings. Items considered in the engineer's estimate of construction costs are embankment fill, timber clearing, principal spillway, foundation and embankment drainage, channel excavation, bank stabilization, side inlet drop structures, and channel stabilization. Engineering services costs of \$37,500 include direct cost of engineers and other technicians for surveys, investigations, design and preparation of plans and specifications for structural measures including vegetative work associated therewith. Project Administration costs of \$79,000 include the cost of contract administration, review of engineering plans prepared by others, government representatives, construction surveys, and inspection.

Installation costs of these structural measures to be borne by the sponsors include the value of land, project administration, water rights, modification of roads, bridges, and utilities, and legal fees. The construction cost of the one floodwater retarding structure is estimated to be \$180,000. The construction cost of the multipurpose channel, multipurpose laterals and appurtenant structures are estimated to be \$169,100. Local sponsor costs will include land rights, bridge and pipeline modification, and legal fees.

Table 2A shows the Cost Allocation and Cost Sharing by purpose for the multipurpose channel. Costs of the multi-purpose channel were allocated to purpose based on the areal relationships of wet and non-wet land in the drainage area of the channel. This results in \$279,600 (87.5 percent) being allocated to flood prevention and \$40,000 (12.5 percent) being allocated to drainage.

The estimated schedule of obligation for the 5-year installation period covering installation of both land treatment and structural measures is:

	P. L. 566 Funds		Other Funds		
Fiscal Year	Land Treatment Measures	Structural Measures	Land Treatment Measures	Structural Measures	Total
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
1	2,000		66,820	49,600	118,420
2	1,500	115,000	50,000	40,000	206,500
3	1,500	115,000	50,000	40,000	206,500
4	1,500	113,000	50,000	40,000	204,500
5	1,500	112,000	50,000	40,000	203,500
Total	8,000	455,000	266,820	209,600	939,420

#### BENEFITS - MONETARY

The total average annual benefits resulting from the installation of structural measures are estimated to be \$59,810 (Table 6). Of this total, \$45,300 in benefits will accrue directly to agriculture. The planned project includes crop and pasture benefits from both flood prevention and agricultural water management (drainage). The average annual crop and pasture flood prevention benefits amount to \$39,700 (Table 5 and 6).

The benefits which are estimated to accrue annually to drainage are \$5,600.

Since the watershed is located in an area designated by the Secretary of Agriculture as eligible for rural area development under the Economic Development Act of 1965, employment benefits are used for project development. The employment benefits accrue through the employment of unemployed and under-employed during the installation of the project and from operations and maintenance of project measures during a 20-year period. The average annual amount of these benefits is estimated to be \$3,570.

Average annual external economic benefits, the net increase in the value of goods and services generated by the project, are estimated to be \$10,940.

### COMPARISON OF BENEFITS AND COSTS

The average annual cost of structural measures (amortized installation cost plus operations and maintenance) is \$42,113. The installation of the structural measures is expected to produce average annual primary benefits of \$48,870. The ratio of these benefits to cost is 1.2:1.0.

The total benefits, including external economies, from structural measures amounts to \$59,810, and will provide \$1.42 for each dollar of costs (Table 6).

## INSTALLATION PROVISIONS

The land treatment measures will be established by the landowners or operators over a 5-year period in cooperation with the Valliant Conservation District. The Soil Conservation Service, through the Conservation District, is giving technical assistance in the planning and application of these measures under going programs. Technical assistance will be accelerated by assignment of additional personnel, as needed, to assure satisfactory planning progress and the application of the planned measures within the project installation period. Technical assistance for forestry improvements will be provided by the Oklahoma Forestry Division under the going Cooperative Forest Management programs.

The governing body of the Valliant Conservation District will assume leadership in accelerating installation of the planned land treatment measures. The landowners and operators within the watershed will be encouraged to apply and maintain soil and water conservation measures on their farms and ranches. District-owned equipment will be made available to the landowners and operators in accordance with existing arrangements for usage of equipment in the district.

The Bureau of Indian Affairs will assist with land rights on structures which affect Indian land under their jurisdiction. They will, through their operating units, give technical assistance in the planning and application of land treatment measures under going programs.

The floodwater retarding structure will be constructed prior to the channel work. The concrete drop and other appurtenant structures may be constructed prior to or at the same time as the channel work.

The local sponsoring organization has formally requested the Soil Conservation Service to do the contracting for all structural measures. The local sponsors will provide, at no cost to the federal government, all the land rights. They will also provide for the relocation, removal or modification of any roads, utilities, pipelines, or other improvements that might hamper construction of the structural measures.

Federal funds may be provided and construction of planned structures may be started when local sponsors:

- A.1. Have power of eminent domain.
2. Have enough funds on hand which, when associated with a plan to raise additional needed funds to complete the project, can be considered by the Service to be adequate to support a design and construction start based upon demonstrated ability to secure needed land rights.
3. Have assured the State Conservationist that they will use the power of eminent domain and their financial



resources to obtain all remaining land rights for all structural measures in any construction unit on which construction is to be authorized.

4. Have obtained all needed land rights or options for land rights for 50 percent of the structural measures on the project which represents two years design and construction work.
5. Have the structural measures cleared in groups forming logical Contract Units.

or:

- B.1. Have met the first three requirements of option A.
2. Have obtained all land rights or options for land rights for 50 percent of the structural measures.
3. Have obtained all land rights or options for land rights on all structural measures forming a logical Contract Unit providing at least two years of design and construction work.

Technical assistance will be provided by the Soil Conservation Service in the preparation of plans and specifications, supervision of construction, preparation of contract payment estimates, final inspection, execution of certificates of completion, and related tasks for the establishment of the structural measures.

There are three prehistoric archeological sites in the project area. The channel work in these site vicinities will be confined to the present channel area. Construction equipment will operate from the opposite side of the channel from the site area and any spoil will also be placed on the opposite side of the channel. The actual site area will be flagged and the construction inspector will prevent any construction activities from occurring in the area.

The Soil Conservation Service recognizes that archeological sites undetectable from surface evidence may be unearthed by construction activities. An archeologist employed full time by the Oklahoma Conservation Commission will identify and evaluate such discoveries to determine salvage or preservation needs. These needs will then be reported to the National Park Service for appropriate action.

Since this is a federally assisted local project, there will be no change in the existing responsibilities of any federal agency under Executive Order 11593 with respect to archeological and historical resources.

## OPERATION AND MAINTENANCE PROVISIONS

### Land Treatment Measures

Land treatment measures will be maintained by the landowners or operators of the farms on which the measures are installed under agreement with the Valliant Conservation District. Representatives of the Conservation District will make, or cause to be made, periodic inspections of the completed land treatment measures to determine maintenance needs and to encourage landowners and operators to perform needed maintenance. They will make district-owned equipment available for this purpose.

### Structural Measures

The one single purpose floodwater retarding structure, the 9.20 miles of channels, and the wildlife habitat mitigation measures will be operated and maintained jointly by the McKinney-Buzzard Creek Conservancy District and the Valliant Conservation District.

The local sponsoring organizations will execute agreements on the operation and maintenance of structural measures for which each is responsible before a land rights or project agreement is signed. The agreements will declare the amount of funds on hand for maintenance purposes and specify methods of replacing funds as they are used. The agreements will also contain a reference to the State Watershed Operation and Maintenance Handbook which will be used as a guide in preparing individual operation and maintenance plans for each structural measure. The agreements are subject to approval of the State Conservationist prior to disbursement of federal funds for construction. They understand that the functions of operation and maintenance includes the items discussed in the following paragraphs and in addition any other unforeseen maintenance needs.

Operations -- Action taken by the sponsors to make the structure function as designed. Operation includes the operation of gates and other features to regulate the retention or release of water for flood control or other use in accordance with a predetermined plan. Operation must comply with state or local laws as they apply to the use and control of water.

Maintenance -- Work done by the sponsors to keep the structure in good operating condition during its useful life.

The maintenance of an adequate vegetative cover of desirable species requires the repairing and reseedling of eroded areas, controlling undesirable vegetation, fertilization, controlled grazing, and replacement of dead shrubs in wildlife plantings.

Earth dam maintenance should include replacement of soil removed by rodents, clean out or replacement of relief wells and drains, repair

of damaged rip-rap, stabilization of slide areas, maintenance of dikes at proper elevation, replacement of eroded material, immediate revegetation of any eroded areas that develop in the emergency spillway, and fence repair, as well as removal or control of undesirable vegetation, fertilization and controlled grazing.

Maintenance includes performance of work and the application of measures to prevent deterioration as well as repairing damages after they occur. This includes both the routine and recurring needs such as repainting exposed surfaces or fertilizing vegetation and the more complex, costly, and skilled work required to make needed repairs, or to replace concrete, steel, or earthen portions of structure measures. Skilled labor, heavy equipment, materials, and costly specialized machinery may be required. The cost can usually be minimized by performing maintenance when it is first needed. The need may occur at any time and usually can be expected to be in proportion to the severity of storms. The repair of damages to completed structural measures and to established vegetative measures caused by deterioration, flash floods, abnormal rainfall events, or vandalism is maintenance regardless of whether it occurs immediately after or several years after a work of improvement is completed or established.

Operation and maintenance for the structural measures will be accomplished through the use of contributed labor and equipment, by contract, district-owned equipment, force account, or a combination of these methods.

The estimated average annual operation and maintenance costs are as follows:

1 single-purpose floodwater retarding structure and appurtenances	\$	300
9.20 miles of multipurpose channels and appurtenances	\$	900
Wildlife mitigation measures	\$	100

Operation and maintenance inspections for all structural measures will be made on the following basis:

A designated Service representative and the Sponsors will make a joint inspection of all structural measures annually, after unusually severe floods, and after the occurrence of any other unusual conditions. These inspections shall continue for three years following installation of each structure. Inspections after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service representative.

Travelways for maintenance shall be provided as a part of all channel improvement. A travelway shall be provided on each side of large channels if necessary for use of maintenance equipment. Travelways must be adequate for movement and operation of equipment required for maintenance of the channel. The travelway may be located adjacent to the channel on a berm or on the spread spoil. In some situations the channel itself may be used as the travelway.

Roads and rights-of-way will be provided so that all parts of the channel may be accessible for maintenance purposes. The location of these maintenance roads will be shown on the land rights map.

District and federal representatives will have free access to inspect the improvements at any time.

The sponsoring local organizations fully understand their obligations for maintenance and will execute maintenance agreements prior to an invitation to bid. The operation and maintenance agreement will include specific provisions for retention and disposal of property acquired, or improved, with PL-566 financial assistance.

## FINANCING PROJECT

Federal assistance for carrying out the works of improvement as described in this work plan will be provided under the authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83rd Congress, 68 Stat. 666), as amended.

All necessary land rights and removal or modification of roads, bridges, pipelines, and utilities will be obtained before federal financial assistance is made available for installation of structural measures. The non-federal part of the cost of installing the project will be met largely by donations of land rights, material, labor, equipment, services, and money. Landowners affected by structural measures were contacted by the local sponsors during the development of the work plan and it is expected that most of the needed land rights will be donated.

If funds obtained by contributions and the use of state, county, and local revolving funds prove inadequate, the amount of additional funds needed to finish the project will be estimated and an application may be made to borrow these funds from the Farmers Home Administration.

The Soil Conservation Service has been formally requested by the sponsors to contract for the construction of the structural measures. The Valliant Conservation District will be the sponsor designated to deal with the Service. The sponsoring organizations understand their obligations and expected expense and are prepared to carry out their part of project installation.

If the sponsors decide to do their own contracting, or will otherwise receive PL-566 funds, prior to entering into agreements that obligate funds of the Service, the Valliant Conservation District will have a financial management and system for control, accountability, and disclosure of PL-566 funds received, and for control and accountability for property and other assets purchased with PL-566 funds.

Program income earned during the grant period will be reported on the sponsors request for advance or reimbursement from the Service.



TABLE 1 - ESTIMATED PROJECT INSTALLATION COST  
McKinney-Buzzard Creek Watershed, Oklahoma

Installation Cost Item	Unit	Number to be Applied			Estimated Cost (Dollars) 1/			Total
		SCS	BIA	Total	P.L. 566 Funds	Other Funds	Total	
LAND TREATMENT 5/								
Gropland	Acre	1,710	190	1,900	48,270	3,000	51,270	51,270
Pastureland	Acre	3,600	102	3,702	201,000	5,000	206,000	206,000
Rangeland	Acre	1,350		1,350	5,550		5,550	5,550
Forestland	Acre	100		100		2,000	2,000	2,000
Technical Assistance					8,000	8,000	2,000	10,000
TOTAL LAND TREATMENT								
					8,000	8,000	2,000	274,820
STRUCTURAL MEASURES								
Construction	No.	1			180,000			180,000
Floodwater Ret. Structures								
Channel Work								
N 3/	Miles	6.48			139,300	9,300	9,300	148,600
M 3/	Miles	0.30			1,400	100	100	1,500
O 3/	Miles	2.42			17,800	1,200	1,200	19,000
Sub-Total Construction					338,500	338,500	10,600	349,100
Engineering Services								
Project Administration					37,500	37,500		37,500
Construction Inspection					68,800	68,800		68,800
Other					10,200	10,500	10,500	20,700
Sub-Total Project Administration					79,000	79,000	10,500 2/	89,500
Other Costs								
Land Rights						187,500	187,500	187,500
Water Rights						1,000	1,000	1,000
Sub-Total - Other Costs						188,500	188,500	188,500
TOTAL STRUCTURAL MEASURES								
					455,000	455,000	209,600	664,600
TOTAL PROJECT								
					463,000	463,000	466,420	939,420
						8,000	2,000	476,420

1/ Price Base: 1975

2/ Includes \$1,000 Legal Fees.

3/ Type of channel before project (N) an unmodified, well defined natural channel or stream;

(M) man made ditch or previously modified channel; (O) none or practically no defined channel.

4/ Federal agency responsible for assisting in installation of works of improvement.

5/ Includes only areas estimated to be adequately treated during the project installation period. Treatment will be

accelerated throughout the watershed, and dollar amounts apply to total land areas, not just to adequately

treated areas.

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TABLE 1A - STATUS OF WATERSHED WORKS OF IMPROVEMENT

## McKinney-Buzzard Creek Watershed, Oklahoma

Measure	: Unit	: Number : Applied : to Date :	: Total Cost (Dollars) <u>1/</u>
<u>LAND TREATMENT</u>			
Conservation Cropping System	Acre	1,690	25,350
Crop Residue Use	Acre	1,900	1,900
Drainage	Feet	26,150	26,150
Pasture Planting	Acre	3,547	177,350
Ponds	Number	86	51,600
Proper Grazing	Acre	822	820
TOTAL			283,170

1/ Price Base: 1975

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TABLE 2 - ESTIMATED STRUCTURAL COST DISTRIBUTION

McKinney-Buzzard Creek Watershed, Oklahoma

Item	INSTALLATION COST (Dollars) 1/							Total Installation Cost
	P. L. 566 Funds			Other Funds				
	Construc- tion	Engi- neering	Total	Construc- tion	Water Rights	Land Rights	Total	
Floodwater Retarding Structure No. 1	180,000	19,000	199,000		1,000	55,500	56,500	255,500
Main Channel No. 1 & Lateral No. 4 (N) 3/	139,300	15,850	155,150	9,300		108,000	117,300	272,450
Lateral No. 1 (M)	1,400	200	1,600	100		2,500	2,600	4,200
Laterals No. 2, 2A, 3, 5, and 6 (O)	17,800	2,450	20,250	1,200		21,500	22,700	42,950
Subtotal	158,500	18,500	177,000	10,600		132,000	142,600	319,600
Project Administration			79,000			10,500 2/		89,500
TOTAL	338,500	37,500	455,000	10,600	1,000	187,500	209,600	664,600

1/ Price Base: 1975

2/ Includes \$1,000 Legal Fees

3/ Type of channel before project: (N) an unmodified, well defined natural channel or stream;  
(M) man made ditch or previously modified channel; (O) none or practically no defined channel.

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TABLE 2A - COST ALLOCATION AND COST SHARING SUMMARY

McKinney-Buzzard Creek Watershed, Oklahoma  
(Dollars) 1/

Item	COST ALLOCATION			COST SHARING				
	Flood Prevention	Drainage	Purpose	P. L. 566		Flood Prevention	Drainage	Other
				Total	Total			
Floodwater Retarding Structure No. 1	255,500			255,500	199,000	199,000	56,500	56,500
Channel Work	279,600	40,000		319,600	164,100	12,900	177,000	115,500
GRAND TOTAL	535,100	40,000		575,100	363,100	12,900	376,000	172,000
							27,100	199,100

1/ Price Base: 1975

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TABLE 3 - STRUCTURAL DATA  
STRUCTURE WITH PLANNED STORAGE CAPACITY

McKinney-Buzzard Creek Watershed, Oklahoma

Item	Unit	Structure Number 1
Class of Structure		a
Drainage Area	Sq. Mi.	11.95
Curve No. (1-day)(AMC II)		85
Elevation Top of Dam	Ft.	433.3
Elevation Crest Emergency Spillway	Ft.	429.8
Elevation Top of Riser (50-year)	Ft.	409.0
Maximum Height of Dam	Ft.	41
Volume of Fill	Cu.Yds.	160,000
Total Capacity 1/	Ac. Ft.	4,745
Sediment Submerged 1st 50-years	Ac. Ft.	261
Sediment Submerged 2nd 50-years	Ac. Ft.	287
Sediment Aerated	Ac. Ft.	51
Retarding	Ac. Ft.	4,146
Surface Area		
Sediment Pool (50-year)	Acres	51
Retarding Pool	Acres	495
Principal Spillway Design		
Rainfall Volume (areal)(1-day)	In.	8.05
Rainfall Volume (areal)(10-day)	In.	14.03
Runoff Volume (10-day)	In.	10.31
Capacity	cfs	243
Frequency Operation - Emergency Spillway	%chance	2.8
Dimensions of Conduit	In.	42
Emergency Spillway Design		
Rainfall Volume (ESH)(Areal)	In.	8.19
Runoff Volume (ESH)	In.	6.40
Storm Duration	Hrs.	6.0
Type		Veg.
Bottom Width 3/	Ft.	200
Velocity of flow (Ve) 2/	Ft/Sec	5.50
Slope of exit channel (Sc) 2/	Ft/Ft	0.025
Max. Reservoir Water Surface Elevation	Ft.	
Freeboard Design		
Rainfall Volume (FH)(Areal)	In.	12.92
Runoff Volume (FH)	In.	11.03
Storm Duration	Hrs.	6.0
Max. Reservoir Water Surface Elevation	Ft.	433.3
Capacity Equivalents		
Sediment Volume	In.	0.94
Retarding Volume	In.	6.51

1/ Crest of Emergency Spillway.

2/ Based on 25% of maximum flow during passage of freeboard hydrograph.

3/ Guidelines in Technical Release No. 52 were used in the dimensioning of the emergency spillway system for this structure.





TABLE 3A - STRUCTURE DATA

## CHANNELS

McKinney-Buzzard Creek Watershed, Oklahoma

Channel No.	Station or Reach	Drainage Area : Acres	Capacity : Cfs	Hydraulic Gradient : (ft/ft)	Channel Dimensions : Bottom : Width : Grade : of Flow : Slopes : Bottom : Depth : Side : "n" value : As : Built : Aged : As Built : Cu. Yds. Work : Excavation : of Channel : Type of : Flow : Conditions	Velocities : ft/sec : Aged : As Built : Cu. Yds. Work : Excavation : of Channel : Type of : Flow : Conditions
Main No. 1	297+00	280	25	0.0007	4.0 0.07 2.2 4:1 0.045 0.025 1.02 2.24	II 1/ N 2/ E 3/
"	262+00					
"	262+00	525	47	0.0008	6.0 0.08 2.6 4:1 0.045 0.025 1.17 3.67	II N E
"	209+00					
"	209+00	829	65	0.0008	6.0 0.08 3.1 2.5:1 0.040 0.025 1.55 5.61	II N E
"	189+00					
"	189+00	1,573	120	0.0007	8.0 0.015 3.9 2.5:1 0.040 0.025 1.75 5.61	II N E
"	176+00					
"	176+00	1,694	120	0.00025	8.0 0.025 5.0 2.5:1 0.040 0.025 1.20 2.52	II N E
"	107+00					
"	107+00	2,551	143	0.00025	8.0 0.055 5.4 2.5:1 0.040 0.025 1.26 4.13	II N E
"	60+00					
"	20+00	2,742	152	0.00025	8.0 0.030 5.5 3.0:1 0.040 0.025 1.28 2.33	II N E
"	20+00					
"	4+00	3,365	180	0.0003	8.0 0.030 5.0 3.0:1 0.040 0.025 1.31 2.10	II N E

See footnotes on following page.

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TABLE 3A - STRUCTURE DATA (CONT'D)

## CHANNELS

McKinney-Buzzard Creek Watershed, Oklahoma

Channel No.	Station or Reach	Drainage Area : Acres	Capacity : cfs	Hydraulic Gradient : (Ft/Ft)	Channel Dimensions :			Velocities : ft./sec.	Type :											
					Bottom : Width	Depth : Grade	Side : Slopes		As Built : Aged	As Built : Aged	As Work : Aged									
			Req'd	Design																
Lat. No.1	0+00	120	11	26	0.0025	V	0.25	2.0	4:1	0.045	0.025	1.62	2.92	1,280	II	I/	M	2/	E	3/
Lat. No.2	0+00	704	49	51	0.0005	V	0.05	3.5	4:1	0.045	0.025	1.05	2.00	13,890	I		O		E	
Lat.No. 2A	0+00	44	5	10	0.00055	V	0.055	2.0	4:1	0.045	0.025	0.65	1.23	1,050	I		O		E	
Lat.No. 3	0+00	245	20	20	0.0015	V	0.15	2.0	4:1	0.045	0.025	1.26	2.27	1,820	I		O		E	
Lat. No.4	0+00	175	15	21	0.00055	V	0.055	2.5	4:1	0.045	0.025	0.87	1.65	4,090	II		N		E	
Lat. No.5	0+00	100	10	13	0.0002	V	0.02	2.5	4:1	0.045	0.025	0.53	0.95	3,840	I		O		E	
Lat. No.6	0+00	100	10	13	0.0002	V	0.02	2.5	4:1	0.045	0.025	0.53	1.00	1,500	I		O		E	

1/ Type I - new channel established; Type II - enlargement or realignment of existing channel.

2/ N - Natural stream channel; M - modified channel; O - No channel or barely defined channel.

3/ E - ephemeral; S - standing water.

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TABLE 3B - STRUCTURAL DATA

## GRADE STABILIZATION STRUCTURE

MCKINNEY-BUZZARD CREEK WATERSHED, OKLAHOMA

Number of Structures	Drainage : Area :	Design Cap. : Prin. Spwy. :	: Drop :	Type of : Structure :	Concrete (Cu.Yds)
	(Acres)	(cfs)	(feet)		
1	3,365	180	6	C	79.3
7	10	8	7	CMP Drop <u>1/</u>	
1	20	12	7	" "	
4	30	15	8	" "	
4	40	19	7	" "	
3	50	23	8	" "	
5	60	25	7	" "	
2	80	30	7	" "	
1	120	40	8	" "	
1	160	50	8	" "	

1/ CMP - Corrugated metal pipe arch.

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TABLE 4 - ANNUAL COST

McKinney-Buzzard Creek Watershed, Oklahoma  
(Dollars)1/

Evaluation Unit	: Amortization of : Installation : Cost <u>2/</u>	: Operation and : Maintenance : Cost	: Total
Floodwater Retarding Structure No. 1	15,690	300	15,990
Channel Work	19,627	1,000	20,627
Project Administration	5,496		5,496
TOTAL	40,813	1,300	42,113

1/ Price Base: 1975

2/ 100-years at 6.125 percent interest.

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TABLE 5 - ESTIMATED AVERAGE ANNUAL  
FLOOD DAMAGE REDUCTION BENEFITS

McKinney-Buzzard Creek Watershed, Oklahoma  
(Dollars) 1/

Item	<u>Estimated Average Annual Damage</u>		Damage
	Without Project	With Project	Reduction Benefit
Floodwater			
Crop and Pasture	42,800	3,100	39,700
TOTAL	42,800	3,100	39,700

1/ Price base: Current normalized prices, February 1974.

2/ Excludes effects of land treatment measures.

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TABLE 6 - COMPARISON OF BENEFITS AND COSTS

McKinney-Buzzard Creek Watershed, Oklahoma  
(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS 1/				Average : Benefit	
	:Flood Prevention:Agri. Water Mgn.: :Employ- :External :	ment :		Economies: Total	: Annual : Cost	: Ratio
Floodwater Retarding Structure No. 1, Channel Work, and Appurtenant Structures	39,700	5,600	3,570	10,940	59,810	36,617 1.6:1
Project Administration					5,496	
GRAND TOTAL	39,700	5,600	3,570	10,940	59,810	42,113 1.4:1

1/ Price Base: Crop and pasture benefits current normalized prices, February 1974.

2/ Installation 1975 prices amortized for 100 years at 6.125 percent interest. Operation and Maintenance - 1975 prices.

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PRINCIPLES AND STANDARDS  
PHASE IN ADDENDUM

McKinney-Buzzard Creek Watershed

INTRODUCTION

This addendum is based on the Water Resource Council's "Principles and Standards for Planning Water and Related Land Resources," which became effective October 30, 1973. It is prepared to be consistent with the requirements of the Water Resource Council's Procedure No. 1 for the phase-in of the Principles and Standards. The information presented is:

Part 1 - Benefits to Cost Comparison

An evaluation of the selected plan using current normalized prices, current construction costs, and the current interest rate.

Part 2 - Four Account Displays

Evaluated effects of the selected plan are displayed under separate accounts for (1) National Economic Development, (2) Environmental Quality, (3) Regional Development, and (4) Social Well-Being. The displays are consistent with the intent of the Principles and Standards.

Part 3 - Abbreviated Environmental Quality Plan

An environmental quality plan, consistent with the intent of the Principles and Standards, but which is abridged in detail, has been developed by an interdisciplinary team. It is formulated to enhance environmental quality by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems. This plan was formulated from information and data obtained during the investigative and analysis phases of project planning. Formulation began with the inventory and recognition of the watershed problems and needs. Desired environmental effects, as translated from the problems and needs, provided a basis for examining appropriate water and land resource use and management opportunities. Opportunities that emphasized contributions to the component needs were selected and are shown as plan elements of the abbreviated environmental quality plan. The cost of \$942,420 for its installation is a preliminary estimate.

Implementation of features of this environmental quality plan would require acceptance by the local people. Adequate legal authorities do exist for installation.

## PART 1

The project cost, benefits, and benefit-cost ratio based on a 6.125 percent interest rate, current normalized prices, and the 1974 price base, are used in the following table:

1. Annual costs are	\$42,113
2. Annual benefits are	59,810
3. The project benefit-cost ratio is	1.4:1
4. The project benefit-cost ratio excluding secondary benefits is	1.2:1

## PART 2

## SELECTED PLAN

NATIONAL ECONOMIC DEVELOPMENT ACCOUNT  
McKinney-Buzzard Creek Watershed  
McCurtain County, Oklahoma

Components	Measures of Effect 1/ (Average Annual)	Components	Measures of Effect 1/ (Average Annual)
Beneficial effects:			
A. The value to users of increased outputs of goods and services		Adverse effects:	
		A. The value of resources required for a plan	
1. Flood prevention	\$ 39,700	1. Floodwater retarding structure, channels and appurtenant structures	\$ 35,317
2. Drainage	5,600	Structure installation	1,300
3. Utilization of unemployed and underemployed labor resources		O&M	5,496
a. Project construction	3,000	2. Project administration	
b. O&M	570		
		Total Adverse effects	\$ 42,113
Total Beneficial effects	\$ 48,870	Net Beneficial effects	\$ 6,757

1/ 100 years @ 6.125 percent interest.





PART 2  
SELECTED PLAN  
ENVIRONMENTAL QUALITY ACCOUNT  
McKinney-Buzzard Creek Watershed  
McCurtain County, Oklahoma

Components	Measures of effects
------------	---------------------

Beneficial and adverse effects:

A. Areas of natural beauty.

1. Swampy, unsightly, and unproductive areas will be drained and made productive and more pleasing to the sight.
2. Fifty-one acres of wooded pasture and streambed will be converted to a permanent lake area.
3. Temporary inundation during periods of excessive runoff will occur on 419 acres of stream channel and land presently in wooded pasture.
4. Wooded pasture being periodically inundated will be partly developed into improved pasture.

B. Quality considerations of water, land, and air resources.

1. Erosion of upland will be reduced.
2. Flows from floodwater retarding structure, during storm runoff periods, will carry less sediment than without project condition.
3. Waterlogged land will be aerated as a result of a channel for the removal of surplus water.
4. The elimination of some wet areas will reduce habitat for some wildlife species.
5. Drainage of wetland areas will reduce their potential in reducing downstream flood damages through the reduction of natural storage.



PART 2  
SELECTED PLAN  
ENVIRONMENTAL QUALITY ACCOUNT

McKinney-Buzzard Creek Watershed  
McCurtain County, Oklahoma

Components	Measures of effects
C. Biological resources and selected ecosystems.	<ol style="list-style-type: none"> <li>1. Drainage channels will be effective in changing existing species of plant and animal life due to habitat alterations.</li> <li>2. Potential plant and animal life in drained areas will complement conditions that have favorable influence on the life of an individual or community.</li> <li>3. 100 acres of occasionally inundated cropland and pasture-land which provides limited habitat for waterfowl will be lost.</li> </ol>
D. Irreversible or irretrievable commitments.	<ol style="list-style-type: none"> <li>1. The capital investment, labor, energy for construction, and a portion of the materials are totally committed resources in this project.</li> <li>2. About 40 acres of land devoted to the new stream channel will be permanently removed from agricultural production.</li> <li>3. About 56 acres of land devoted to the sediment pool and the dam will be removed from agricultural production for the life of the project.</li> </ol>



PART 2  
SELECTED PLAN  
REGIONAL DEVELOPMENT ACCOUNT

McKinney-Buzzard Creek Watershed  
McCurtain County, Oklahoma

Components		Measures of Effects State of Oklahoma Rest of Nation (Average Annual)		Components		Measures of Effects State of Oklahoma Rest of Nation (Average Annual)	
Income.				Income.			
Beneficial effects:				Adverse effects:			
A. The value of increased output of goods and services to users residing in the region				A. The value of resources contributed from within the region to achieve the outputs			
1. Flood prevention			0	1. Floodwater retarding structure, channels and appurtenances			
2. Drainage	\$39,700		0	Project installation	\$12,227	\$23,090	
3. Utilization of unemployed and underemployed labor resources	5,600			OM&R	1,300	0	
a. Project construction		3,000	0	2. Project administration	645	4,851	
b. Project OM&R		570	0				
B. The value of output to users residing in the region from external economies							
1. Indirect activities associated with increased net returns from flood prevention and drainage.		10,940	0	Total Adverse effects	\$14,172	\$27,941	
Total Beneficial effects	\$59,810		0	Net Beneficial effects	\$45,638	-27,941	

1/ 100-years @ 6.125 percent interest.



PART 2  
SELECTED PLAN  
REGIONAL DEVELOPMENT ACCOUNT

McKinney-Buzzard Creek Watershed  
McCurtain County, Oklahoma

Components	Measures of Effects		Components	Measures of Effects	
	State of Oklahoma	Rest of Nation		State of Oklahoma	Rest of Nation
Employment.			Employment.		
Beneficial effects:			Adverse effects:		
A. Increase in the number and types of jobs.			A. Decrease in number and types of jobs.		
1. Agricultural employment.	5 man-yrs, annual- ly, of employment in agri. produc- tion.	-	1. Lost in agricultural employment of project take area.	0	-
2. Employment for project construc- tion.	7 man-yrs of semi-skilled employment.	-			
3. Employment for project OM&R	0.4 man-yrs, annually, of semi- skilled employ- ment.	-			
Total Beneficial effects	5.4 man-yrs of semi-skilled jobs, annually, and 7 man-yrs of semi- skilled employment during project construction.	-	Total Adverse effects	0	-
			Net Beneficial effects	5.4 man-yrs of semi-skilled jobs, annually, and 7 man-yrs of semi- skilled employment during project construction.	-





# PART 2

## SELECTED PLAN REGIONAL DEVELOPMENT ACCOUNT

McKinney-Buzzard Creek Watershed  
McCurtain County, Oklahoma

Components	<u>Measures of Effects</u>	
	State of Oklahoma	Rest of Nation
Population Distribution.		
Beneficial effects:	Project is not expected to have any effect on population distribution.	-
Adverse effects:	-	-
Regional Economic Base and Stability.		
Beneficial effects:	Creates 5 man-yrs, annually, of employment in agricultural produc- tion; 7 man-yrs of semi- skilled employment; and 0.4 man-yrs, annually, of semi-skilled employ- ment.	-



PART 2

SELECTED PLAN  
SOCIAL WELL-BEING ACCOUNT

McKinney-Buzzard Creek Watershed  
McCurtain County, Oklahoma

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Components	Measures of Effects
Beneficial and Adverse effects:	
a. Real income distribution	<ol style="list-style-type: none"><li>1. Create regional income benefit distribution of \$60,270. The percentage distribution of benefits by income classes is not readily available.</li><li>2. Local costs to be borne by the region total \$13,660. The percentages of contribution to local costs by income classes is not readily available.</li><li>3. Employment will be increased by 5.4 man-years of annual employment and 7 man-years of employment during project construction.</li><li>4. About 20 owners and operators of alluvial lands will be directly benefitted by project installation.</li><li>5. The monetary output value of crops and livestock will be increased by approximately \$76,200, annually.</li></ol>
B. Life, health, and safety	<ol style="list-style-type: none"><li>1. Tension and worry about flood losses will be reduced.</li><li>2. Drainage of stagnant pools will reduce the prevalence of disease vector organisms.</li><li>3. The danger of life as a result of washed out roads and bridges will be reduced.</li></ol>

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## PART 3

### ABBREVIATED ENVIRONMENTAL QUALITY PLAN

The principal environmental quality problems in the watershed are the deterioration of the land, plant, and water resources due to erosion on the uplands, poor drainage on the bottom lands, and the threat of loss of property and impairment of livelihood by flooding in the bottom lands.

Component needs for solving problems relating to specific environmental conditions are listed below:

1. Areas of natural beauty.
  - a. Reduce sheet and gully erosion in the uplands.
  - b. Improve the esthetic value of the landscape, particularly in the flood plain.
2. Quality of water and land resources.
  - a. Improve the quality of water in Buzzard and McKinney Creeks and in McKinney Lake by reducing the sediment presently being delivered to these resources.
  - b. Prolong streamflows in both Buzzard and McKinney Creeks.
  - c. Protect the land resource base from deterioration by reducing sheet and gully erosion, flood plain scour, and sediment deposition.
  - d. Maintain and enhance the productivity of the land resource base.
  - e. Reduce damage to transportation systems and sources of livelihood of human inhabitants by flooding.
3. Biological Resources and Ecosystems.
  - a. Preserve and enhance the habitat for fish and wildlife by streamflow augmentation.
  - b. Preserve and enhance the habitat conditions for fish and wildlife species present in the watershed by:
    - (1) Minimizing destruction of the existing habitat.
    - (2) Providing more dependable food supplies.

- (3) Reducing damage to habitat from flooding, sedimentation, and erosion.
- (4) Creating improved quality habitat for selected species of wildlife.
- (5) Creating additional habitat for fish.
- (6) Creating additional habitat for waterfowl and other water oriented species in the uplands.
- (7) Improving plant-soil-moisture relationships in the flood plain.

The plan elements for environmental quality consist of a system of management practices, land treatment measures, and structural measures.

The EQ plan contains the following:

1. An accelerated land treatment program.
2. One single-purpose floodwater retarding structure for watershed protection, improved wildlife habitat, improved esthetics, and more healthy living conditions.
3. About 9.20 miles of multipurpose channel work for watershed protection, esthetic improvement, improved wildlife habitat, improved living conditions, and reduction of breeding areas for disease vector organisms.

Cropland treatment measures would include conservation cropping systems (use of diversified crops in rotation and management of residues), grassed waterways and terraces, and contour tillage. Grassland treatment measures include proper grazing, range seeding, pasture planting, critical area treatment, and wildlife habitat development. Some 5,000 acres of grassland and 1,900 acres of cropland remain to be treated. Forestland treatment would include timber stand improvement measures. Land users would be encouraged to apply and maintain these measures by the local conservation district, with technical assistance to be supplied by the Soil Conservation Service, and the Oklahoma Forestry Division. Financial assistance, usually on a cost-share basis, is available through programs such as the Rural Environmental Conservation Program administered by the Agricultural Stabilization and Conservation Service.

Installation of a floodwater retarding structure would reduce flood stages on Buzzard and McKinney Creeks, increase fish habitat, and create new habitat for waterfowl and other water oriented species.

Installation of channel work would reduce flooding and improve drainage on McKinney Creek, improve habitat quality for selected species of

wildlife, improve plant-soil-moisture relationships, improve flood plain esthetics, and improve McKinney Creek streamflows. Cost sharing funds are available under Public Law 566.

The estimated installation costs of the elements of the environmental quality plan are as follows:

1. Completion of the application of land treatment measures - \$274,820.
2. One single-purpose floodwater retarding structure - \$180,000.
3. About 9.2 miles of multipurpose channel work - \$169,100.

The total installation cost of the environmental quality plan is estimated to be \$939,420.

All of the identified component needs for environmental quality will be satisfied by plan elements contained in the selected plan. The identified component needs for economic development and environmental quality are compatible. Therefore, the development and display of a separate plan emphasizing environmental quality was determined not to be appropriate. The impacts of the selected plan on the environmental component needs are displayed in the environmental quality account (Part II of the Addendum).





USDA-SCS-EIS-WS-(ADM)-76-1-F-OK

MCKINNEY-BUZZARD CREEK WATERSHED  
McCurtain County, Oklahoma

FINAL ENVIRONMENTAL IMPACT STATEMENT

Roland Willis  
State Conservationist  
Soil Conservation Service

SPONSORING LOCAL ORGANIZATIONS

McKinney-Buzzard Conservancy District  
P. O. Box 405  
Valliant, Oklahoma 74764

Valliant Conservation District  
P. O. Box 405  
Valliant, Oklahoma 74764

December 1975

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service  
Stillwater, Oklahoma 74074



USDA ENVIRONMENTAL IMPACT STATEMENT

McKinney-Buzzard Creek Watershed Project

McCurtain County, Oklahoma  
Prepared in Accordance with  
Sec. 102(2)(C) of P.L. 91-190

Summary

- I. Final
- II. Soil Conservation Service
- III. Administrative
- IV. Description of Action:

The project, located in McCurtain County, Oklahoma, is planned to enhance agricultural production through reduction of flooding and drainage of wet lands, thereby strengthening the economic base of the watershed and its area of influence. The inclusion of environmental amenities will also enhance the quality of life and strengthen the cultural base for residents of the watershed and the surrounding area.

The planned action involves the installation of land treatment measures; one floodwater retarding structure; 9.20 miles of multiple-purpose channel work with appurtenant structures; all to be implemented under authority of the Watershed Protection and Flood Prevention Act (PL-566, 83rd Congress, 68 Stat. 666) as amended. The channel work will involve enlarging or reshaping about 0.8 miles of man-made channel, 6.7 miles of natural channel, and 2.4 miles which have no clearly defined channel.

- V. Summary of Environmental Impacts, Including Favorable and Adverse Effects:
  - 1. Runoff, erosion, and flooding with associated agricultural damages will be reduced.
  - 2. Crop yields and pasture feed values will be increased.
  - 3. Family farms will be stabilized and net returns of low income operators will be increased.
  - 4. Employment opportunities will be created through operation and maintenance of project measures.



5. The lives of travelers, campers, and fishermen, will be protected, and school buses and rural mail carriers will be able to keep better schedules.
6. The destruction of ground nesting birds and animals in the flood plain will be reduced, and thus more stable, permanent wildlife populations will be sustained.
7. About 51 acres of new, high quality water habitat for fish and other wildlife will be created.
8. Stream base flows will be stabilized.
9. The total sediment yield from the watershed will be reduced.
10. The appearance of the flood plain will be improved by replacing the stagnant pools, brush, and weeds along the McKinney Creek channel with a defined channel having vegetated banks and a pleasing appearance.
11. About 1,500 acres will be converted from low intensity, low income producing uses to high intensity, high income producing uses.
12. Water quality below the structure will be improved.
13. The turbidity in McKinney Lake will be reduced.
14. The discovery of five archeological sites which would probably not have been reported otherwise will contribute to archeological knowledge.
15. Land available for agricultural production will be reduced about 100 acres.
16. The use of the 444 acres of land in the retarding pool area which is subject to intermittent inundation will be occasionally interrupted.
17. Land use on areas needed for dams, spillways, channels, and appurtenances will be restricted.
18. Habitat for wildlife making their nest or den in trees, and animals utilizing timber for cover will decrease as a result of timber clearing in the flood plain and the structure area.



19. Wildlife habitat will be temporarily disrupted during construction of structural measures.
20. There will be a localized short term increase in erosion, turbidity, sediment, noise, and dust due to the construction activities.
21. The amount of water reaching the mouth of the watershed will be reduced about 1.75 percent.

VI. Alternative 1 - Accelerated land treatment only.

Alternative 2 - Accelerated land treatment and one floodwater structure.

Alternative 3 - Accelerated land treatment and multipurpose channel work with appurtenant structures.

Alternative 4 - No project.

Alternative 5 - Accelerated land treatment, multipurpose channel work with appurtenant structures, and a dike.

VII. Agencies from which comments were received:

Governor  
Department of the Interior  
Department of Health, Education, and Welfare  
Department of Transportation  
Department of Commerce  
Environmental Protection Agency

VIII. Draft statement transmitted to CEQ December 22, 1975.





USDA SOIL CONSERVATION SERVICE  
FINAL ENVIRONMENTAL IMPACT STATEMENT 1/

for

McKinney-Buzzard Creek Watershed, Oklahoma

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83rd Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

McKinney-Buzzard Creek Conservancy District  
P. O. Box 405  
Valliant, Oklahoma 74764

Valliant Conservation District  
P. O. Box 405  
Valliant, Oklahoma 74764

1/ All information and data, except as otherwise noted, were collected by the SCS, and Forest Service, USDA.



## PROJECT PURPOSES AND GOALS

### 1. Watershed Protection (Conservation Land Treatment)

Conservation plans are to be developed on 95 percent of the farms and ranches in the watershed. Through these plans landowners and operators will be encouraged to use the land within its capabilities and to carry out treatment according to its needs for protection and improvement of the soil resources. These measures applied at an accelerated rate will be effective in reducing soil erosion, improving soil fertility and increasing the productivity of the cropland and grassland in the watershed.

### 2. Flood Prevention

A reduction of 70 to 80 percent in average annual floodwater and associated damages is to be provided to the agricultural flood plain lands. This reduction is to be accomplished with a minimum encroachment on good agricultural land.

### 3. Drainage

Drainage outlets are to be provided for those areas needing drainage. Outlets should remove runoff from a 2-year frequency storm within 18 to 24 hours.

### 4. Fish and Wildlife

A habitat condition is to be provided which will preserve, improve, and perpetuate wildlife resources. The sediment pool of the floodwater retarding structure may be managed for fish, wildlife and waterfowl under going and accelerated programs in conjunction with the Oklahoma Department of Wildlife Conservation.

### 5. Cultural

As many of the historical, cultural, archeological, ecological, scientific, and unique scenic resources will be preserved, enhanced, and developed for the edification and gratification of society as is possible under present regulations and for which funds are available.

### 6. Economic

The economic conditions of low income farm families and rural communities will be improved.



7. General

The final result is to be a watershed which will be an outstanding example of soil and water conservation and a positive contribution to the environment.



## PLANNED PROJECT

### 1. Land Treatment Measures

About 1,900 acres of cropland, 3,702 acres of tame pasture, 1,350 acres of native rangeland, and 100 acres of woodland are scheduled for land treatment during the project installation period.

Conservation land treatment includes measures designed to function as a system in establishing good land cover and soil condition. These measures decrease erosion damage and sediment yields. Each practice is effective by itself. However, the total land treatment system is more effective in reducing erosion. Each system is different, depending on the specific requirements of the land it covers.

These individual systems are covered by conservation plans developed by individual landowners, or operators, assisted by the Soil Conservation Service. The Service provides the technical expertise required to allow the owners and operators to make sound decisions for the use of their land. Technical assistance is also provided by the Service to design, lay out, and check for accurate installation, various structural measures which the landowner installs. He may, or may not, receive monetary assistance for applying these measures. In every case, the application of the measures is strictly voluntary. Since no monetary assistance is provided for many measures, except for funds expended on the technical help provided, the installation of many of these practices depends, to a certain degree, on the economic well being of the farmers and ranchers. The BIA provides services for Indian land through their own conservationists. The Oklahoma Forestry Division, in cooperation with the U. S. Forest Service, provides technical assistance on forest land.

The following list gives a brief description of some of the more commonly used practices in this area:

Conservation Cropping Systems - Growing crops in combination with needed cultural and management measures particularly the use of close growing crops on erodible soil.

Contour Farming - Conducting farming operations on sloping land in such a way that plowing, land preparation, planting and cultivating are done on the contour.

Cover and Green Manure Crop - A crop of close-growing grasses, legumes, or small grain used primarily for seasonal protection and for soil improvement.

Critical Area Planting - Stabilizing severely eroded areas by establishing vegetative cover.

Drainage - The removal of excess surface water or soil water from land by means of surface or sub-surface drains.

Crop Residue Management - Utilizing and managing crop residues for soil protection on a year round basis or when critical erosion periods usually occur.

Diversion - Channel constructed across the slope for the purpose of intercepting runoff.

Grade Stabilization Structure - A structure to stabilize the grade or to control head cutting in natural or artificial channels.

Grassed Waterway or Outlet - A natural or constructed waterway or outlet shaped or graded and established in suitable vegetation as needed for the safe disposal of runoff.

Minimum Tillage - Limiting the number of cultural operations to those that are properly timed and essential to produce a crop and prevent soil damage.

Proper Grazing Use - Grazing at an intensity which will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desired vegetation.

Stripcropping - Growing crops in a systematic arrangement of strips or bands across the general slope or on the contour to reduce water erosion.

Terracing - Development of water storage capacity along the contour by excavation and placement of soil as an embankment along the downstream side. Intervals vary with precipitation, soil and slope.

Woodland Improvement - Improving woodland by removing unmerchantable or unwanted trees, shrubs, or vines.

Woodland Site Preparation - Treating areas to encourage natural seeding of desirable trees or to permit reforestation by planting or direct seeding.

## 2. Structural Measures

### a. Reservoir Type Structures.

One single-purpose floodwater retarding structure will be installed to protect flood plain land that cannot be adequately protected by land treatment measures alone. The drainage area of the proposed structure comprises 48 percent of the watershed, which covers 15,980 acres. When the 2,095 acres which drain directly into the Red River are deducted from the watershed area, the drainage area controlled by the structure would comprise 55 percent of the watershed.



The structure will have a total floodwater detention capacity of 4,146 acre-feet and will temporarily detain 6.51 inches of runoff. The structure is planned to temporarily detain the direct runoff from a 36-year frequency, 10-day storm period.

The principal spillway conduit is to be reinforced concrete pipe with a diameter of 42 inches. There is sufficient capacity in the structure to permit the use of a vegetated earthen emergency spillway.

The structure will involve the use of an earthfill embankment. The foundation will be installed in the Woodbine Formation which is overlain by a high plastic clay soil. Preliminary geologic investigations made on the proposed site indicate adequate borrow is available (mostly clay with some sand and gravel) and no unusual problems are anticipated. No additional land rights will be needed for borrow areas outside the sediment pool.

About 15 acres of woodland consisting of regrowth of predominantly elm and ash will be cleared in the 51-acre sediment pool. The remaining 36 acres is presently in tame pasture.

Provision is made at this site for 100-year sediment storage. The crest of the principal spillway will be set at the 50-year sediment storage elevation. Storage of water to the 100-year sediment storage elevation may be allowed where water rights are obtained to add the second 50-year sediment storage. 1/

The dam will be 41 feet in height. This structure will store water on 51 acres until it is gradually replaced by sediment. The detention pool will involve another 444 acres that are presently occupied by 33 acres of tame pasture, 148 acres of native grass, and 263 acres of grazed woodland. Another 6 acres presently occupied by 2 acres of timber and 4 acres of tame pasture will be involved in the dam and spillway. This makes a total area of 501 acres directly involved in the floodwater retarding structure.

b. Channels.

About 9.20 miles of multipurpose channel work with appurtenant structures are planned for the watershed (see Project Map). The channel work consists of one main channel and six laterals. 2/ The main channel is about 5.84 miles in length. The laterals vary from 0.17 miles to 1.23 miles and have a combined length of 3.36 miles.

1/ Refer to Oklahoma Water Resources Board Resolution of January 10, 1961.

2/ Main channel (No. 1); and six laterals (Nos. 1,2,2A,3,5, and 6).

Of the 5.84 miles of main channel, about 800 feet will be in a previously modified channel, and about 0.5 miles will be a new channel where the natural channel will be straightened in Reach 1. The remainder of the work will occur along the natural channel. Construction of the laterals will involve 0.3 miles of previously modified channel, 0.6 miles of natural channel, and 2.4 miles of undefined channel. The entire creek is classed as an ephemeral stream with the exception of a 1,000-foot section where water is ponded intermittently.

The 2.92 miles of undefined channel will involve construction of essentially new channel. The remaining 6.28 miles will involve enlarging and reshaping the natural channels. The main channel empties into Red River through a slash area and a small lake with a normal maximum depth of about 9 feet. The main channel will be enlarged along its present alignment from station 297+00 to station 162+00 and from station 120+00 to station 29+00. The channel will be realigned and a new channel constructed from station 162+00 to 120+00 and station 29+00 to station 4+00. From station 256+00 to station 248+00 the construction will be done from within the present channel without disturbing vegetation along the channel banks. In all other areas of the channel, to protect vegetation and the three prehistoric archeological sites, construction will be from one side only.

From station 297+00 to station 252+00 4:1 side slopes are planned and from station 252+00 to station 60+00 2.5:1 side slopes are planned for protection against erosion of dispersed soils. A seed mulch will be used for early aging of the channel. From station 60+00 to the outlet 3:1 side slopes are planned. The berms and slopes will be vegetated to stabilize the slopes and prevent erosion. Design computations show the silty sand in the reach from station 20+00 to 49+00 to be potentially unstable for the as-built condition. Provisions will be included in the construction contract for sod-mulching this reach immediately following construction. It is felt that this design will result in a stable channel. However, due to the dispersed soils in the area, there is the possibility that areas of severe erosion could occur at some future date.

The location of the channels on the project map is approximate. The boundaries of the right-of-way needed for excavation and spoil spreading will be shown on the land rights map provided to the sponsors. Spoil will be spread and shaped adjacent to the channel. In areas where land is in cultivation or improved pastures, the spoil will be spread to a maximum height of 3 feet and 8:1 outside side slopes. Where the area to be occupied by the spoil is still in timber which must be cleared, or native grass, the spoil will be shaped to a maximum height of 5 feet and 4:1 outside side slopes. No spoil will be moved beyond the boundaries of the right-of-way designated on the land rights map.

The excavated channel will grade out in fine grained, medium to high plastic soils between stations 297+00 and 85+00. Between stations 85+00 and 50+00 the soils are mostly silty clay or clayey silt with intermingled sand layers. From station 50+00 to the intersection of the channel and the lake, the soils are mostly very sandy with some surface and intermingled clay layers of undetermined lateral extent.

No fences will be built within the design depth of any channel. Where fences cross channels, suitable watergates will be installed and costs will be borne by local interests.

Roads and rights-of-way will be provided so that all parts of the channel will be accessible for maintenance purposes. The location of these maintenance roads will be shown on the land rights map.

A total of 29 grade stabilization structures will be included in the channel system. All of these will be corrugated metal pipe drop structures except the one at the outlet, and most will be located where drainageways enter the deepened main channel. Data concerning these structures is presented in Table 3B and a typical structure is shown in Appendix D.

Approximately 40 acres of bottomland will be in the channels.

#### c. General Provisions.

Land rights for all structural measures will be furnished by local interests. All of the land involved in the structural measures is privately owned and is expected to remain so. Prior to selection of final construction areas, site committees representing the sponsoring organizations made on-site investigations and studied the problems involved. Investigations have determined that proposed structural locations will not result in the displacement of any person, business or farm operation. These locations were approved in formal meetings of these committees.

Three archeological sites (Mc 201, 202, and 203) located in the vicinity of the McKinney Creek channel will be avoided during construction. The Service will locate and flag these areas so that they can be easily identified. The construction inspector will insure that no vehicles or other source of disturbance due to construction activities are allowed in the vicinity of these sites. The other two sites are remote from construction activities. Consequently, the project will have no adverse affect on the identified archeological resources of the watershed. The Secretary of the Interior will be informed of any archeological or historical values found during the installation phases of the project to insure that appropriate action will be taken.

In order to mitigate losses of habitat due to the project, the following items were agreed to by the local sponsors and the U. S. Fish and Wildlife Service:

1. Wildlife habitat strip plantings comparable in amount and quality to habitat destroyed by channel construction will be made along McKinney Creek.
2. A minimum of ten wood duck nesting boxes will be installed near the upstream end of the reservoir and at advantageous locations on Buzzard Creek to mitigate losses of habitat for wood ducks.
3. A minimum of 30 squirrel nesting containers will be constructed and placed in suitable locations near the reservoir to mitigate losses of habitat for squirrels.

In order to minimize damages to wildlife habitat where clearing is unavoidable during channel construction, it will be limited to one side of the channel and as many mast-bearing or other large trees as possible will be left. A biologist or a forester will flag the trees to be saved. In addition, about three acres of habitat plantings for quail and rabbits will be made around the periphery of the reservoir dam and spillway.

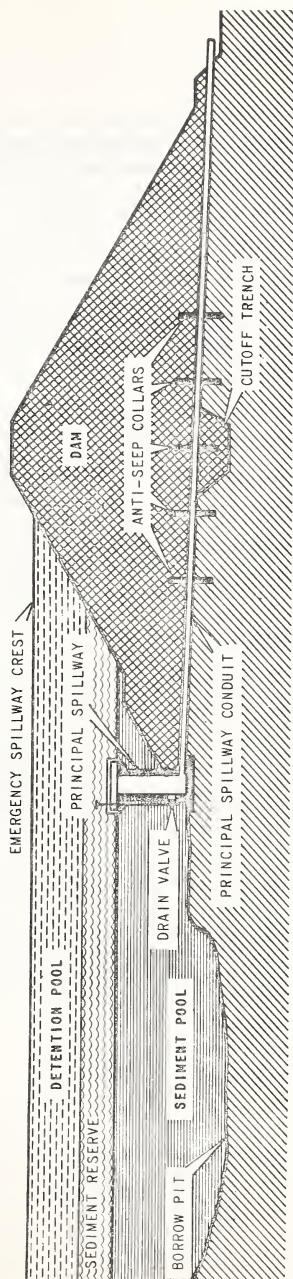
The local sponsors will also be responsible for necessary rebuilding or modification of roads, bridges, and utilities involved in structural measures. These include one pipeline and three bridges in the main channel and one pipeline in the flood-water retarding structure.

The project map (Appendix B) shows the location of the structural works of improvement. Plate 1 is a schematic drawing of a typical floodwater retarding structure.

Appendix E shows the creek flood plains for both Buzzard and McKinney Creeks. The limits of a 100-year frequency storm with and without project and the limits of 10-year and 2-year frequency storm with project are outlined on this figure.

No permanent improvements should be constructed within the limits of the 100-year, with project, flood line. The land area within the 2-year flood limits should be planted in permanent vegetation. Land between the 2-year and 10-year flood lines should also be in permanent vegetation. However, some areas could be utilized for cropland, preferably with drilled or sown crops. The operator should realize that the closer to the 2-year flood

Plate 1



SECTION OF A TYPICAL FLOODWATER RETARDING STRUCTURE

line a field is, the more frequently the area will be flooded and the greater the risks involved in using the area for crop production. The area between the 10-year and 100-year flood lines can be used for cropland with the understanding that the area will still be subject to occasional flooding.

This project plan conforms to all Federal, State, and local laws and regulations and will have no known detrimental effect on any downstream project now in place or that might be constructed in the future. The sediment pool design of the floodwater retarding structure conforms with the Oklahoma Planning and Resources Board Resolution dated January 10, 1961.

Contractors installing the structural measures will be required to adhere to strict guidelines for minimizing soil erosion, water, and air pollution during construction. Such practices as the use of hay or other type mulches and/or temporary vegetation to minimize wind and water erosion, and controlled burning to comply with state standards will be included in the construction contract. Plans for stabilization measures such as sodding or other treatment during, or immediately following, construction will also be a part of the construction contract.

### 3. Operation and Maintenance

Land treatment measures will be maintained by the landowners or operators of the farms on which the measures are installed.

The one single purpose floodwater retarding structure, the 9.20 miles of channel work, and the wildlife mitigation measures, will be operated and maintained jointly by the McKinney-Buzzard Creek Conservancy District and the Valliant Conservation District.

An establishment period of three years will be observed after a structural work of improvement has been accepted from the contractor. During this period, with prior approval of the Administrator, the Service may bear such part of the cost of any needed repairs as is proportionate to the original costs borne by the Service in the construction of the works of improvement. Some types of repair are specifically excluded from this policy.



Operation and Maintenance inspections for all structural measures will be made on the following basis:

A designated Service representative and the Sponsors will make a joint inspection of all structural measures annually, after unusually severe floods, and after the occurrence of any other unusual conditions. These inspections shall continue for three years following installation of each structure. Inspections after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service. In situations where sponsors have shown lack of ability to properly carry out inspections, or where conditions indicate a need for continued Service assistance, the Service may continue to provide assistance after the third year. Such assistance should be provided only in special situations as determined by the State Conservationist on a case-by-case basis.

#### 4. Project Costs

The project costs are shown in the following table:

<u>Item</u>	<u>Costs (dollar)</u>		
	<u>PL-566</u>	<u>Other</u>	<u>Total</u>
Land Treatment	8,000	269,820	277,820
Structural Measures	455,000	209,600	664,600
(Construction)	<u>(338,500)</u>	<u>(10,600)</u>	<u>(349,100)</u>
Total Project	463,000	476,420	939,420

## ENVIRONMENTAL SETTING

### 1. Physical Resources

The watershed is a part of the Red River Basin of the Arkansas-White-Red Region, as delineated by the Water Resources Council. The Red River Basin extends from eastern New Mexico, through the Texas Panhandle, across northern Texas and southern Oklahoma, and into southwestern Arkansas and northwestern Louisiana.

McKinney-Buzzard Creek Watershed drains 15,980 acres (24.97 square miles) in McCurtain County in the southeast corner of Oklahoma. The watershed is about 30 miles west of the Oklahoma-Arkansas boundary. McKinney Buzzard Watershed area drains into the Red River which forms the Oklahoma-Texas boundary.

Towns nearest the watershed are Valliant, Oklahoma, population 840, about a mile west of the upper limit of the watershed boundary, and Millerton, Oklahoma, population 250, located on the watershed boundary about four miles east of Valliant. Other cities and towns within a 50-mile radius of the watershed include Idabel, the county seat of McCurtain County, population 5,946; Hugo, Oklahoma, population 6,585; Broken Bow, Oklahoma, population 2,980; Antlers, Oklahoma, population 2,685; DeQueen, Arkansas, population 3,863; Foreman, Arkansas, population 1,050; Paris, Texas, population 23,441; Clarksville, Texas, population 3,346; and new Boston, Texas, population 4,034. A number of smaller towns and communities occur within the 50-mile radius and the total estimated population within this area is approximately 144,000 people.

The watershed consists of two separate but associated creeks. Buzzard Creek has a drainage area of about 10,200 acres of which approximately 430 acres are alluvial soils. McKinney Creek has a drainage area of about 3,685 acres. In addition to the drainage areas of Buzzard and McKinney Creeks, there are 2,095 acres in the watershed that drain directly into Red River.

Buzzard Creek rises at U. S. Highway 70 about halfway between Valliant and Millerton and flows south for about eight miles where it drains into the Red River about a mile north of Albion, Texas. The lower two miles of Buzzard Creek flows through the alluvial terrace of the Red River. At the point where it emerges from the upland, the channel bends sharply from south to northwest. At this point, a depression extends southeastward across the alluvial terrace generally paralleling the river for about five miles before it enters the Red River. This drainageway is known as McKinney Creek and carries the overflow water from Buzzard Creek during periods of high runoff.



Buzzard Creek is a type N <sup>1/</sup> watercourse and McKinney Creek is type O <sup>2/</sup>. Buzzard Creek is an intermittent stream and McKinney Creek is classified as ephemeral. The only other significant surface water, or watercourse, is a 35-acre natural lake near the mouth of McKinney Creek. This lake was formed in 1958 by sediment deposited by a Red River flood which partially blocked the creek. A beaver colony settled in the lake and built a dam along the sediment bar. The lake has now become a permanent feature of the watershed which receives the flows from McKinney Creek.

The watershed is located on the northern extremity of the Forested Coastal Plains land resource area. The topography of the watershed is gently sloping to hilly in the uplands and almost level on the Red River terrace.

Upland soils have developed from Cretaceous age geologic formations and bottom land soils have developed from alluvial deposits. The warm, humid climate has caused most of the soils on terraces and uplands to be strongly weathered, leached, and acid.

The principal native vegetation on the soils on uplands, such as those in the Felker series, was a mixture of southern pines and hardwoods. The soils on flood plains of the Red River, such as those of the Idabel series, had native vegetation consisting of southern hardwoods. The acid, well-drained soils on flood plains, such as Rexor and Ochlockonee, had native vegetation consisting of a mixture of southern pines and hardwoods. Water tolerant hardwoods were present on the poorly drained Guyton soils. Soils that formed in material weathered from limestone and calcareous shales, such as the Newtonia and Panola, are referred to as prairie areas. They were covered with native mid, and tall, grasses and scattered clumps of elm, Osage orange, and various shrubs. The Ruston, Tisk, and Felker soils, formed under trees, are lower in plant nutrients and organic matter than those formed under grasses such as the Hollywood soils.

Soils that formed from shale, such as Carnasaw, have a clayey subsoil. Those that formed from sandstone, such as Sherwood, have a loamy subsoil. A large area of the county is made up of soils, such as Kinta and Ruston, that formed in clayey and loamy marine sediment.

The alluvium of the county consists of loamy and clayey sediment along the Red River. This fertile sediment is mostly from sources to the west. Other alluvial sediment consists of loamy and clayey sediment from local streams. Examples of soils that formed in Red River alluvium are Roebuck, Redlake, Oklared, and Severn. Examples

1/ Type N watercourses are those with a naturally formed channel.

2/ Type O watercourses are those with little or no clearly defined channel.

of soils that formed in sediment from local streams are Bibb, Iuka, Ochlockonee, and Kaufman (7). 1/

Geologically, the watershed is situated on the Dissected Coastal Plain, an area underlain by Cretaceous rocks that dip gently southward, with a fall of less than 100 feet per mile. Geologic formations exposed in the watershed are, in ascending order, the Antlers Sand, Fredericksburg Group, Washita Group, and the Woodbine Formation.

The Antlers Sand formerly called the Paluxy Sand, is predominantly sandstone with some interbedded clay and gravel lenses. The sandstones, often referred to as "pack sand", are soft, loosely cemented and reddish-brown to light gray in color. The total thickness of the formation is about 500 feet. The topography is rolling to gently rolling and the entire outcrop area was originally tree-covered.

The overlying Fredericksburg Group includes the Walnut Clay, about 6 feet thick, the Goodland Limestone, 25 to 50 feet thick, and the Kiamichi Shale, about 20 feet thick. The Fredericksburg Group was also originally covered with trees.

The Washita Group consists predominantly of shaly clays with minor amounts of interbedded limestones and sandstones. The clay shales, which weather to light grays and yellows, are mostly blue to black in fresh exposures. Total thickness of the unit ranges from 70 to 200 feet. Original vegetative cover was primarily grass with occasional trees on limestone and sandstone areas.

The weakly consolidated sediments of this resource area were deposited as a series of marine terraces with a gentle inclination to the south. Successive layers were deposited in the receding sea, leaving formations as narrow east-west belts. These belts parallel former beach lines that developed as the sea receded toward the present gulf. These soils are deeply leached and strongly acid. All are low, or very low in phosphorus, low in potassium, and require nitrogen for high production.

Elevations in the watershed range from 350 feet above mean sea level at the outlet of McKinney Creek to 546 feet at the upper end of the Buzzard Creek drainage area. Local relief does not exceed 75 feet.

The watershed lies in the humid climatic zone and is characterized by mild temperatures and high rainfall. The average annual precipitation is 47 inches. About 25 percent of this rain falls in April and May. The remainder is fairly evenly distributed throughout the year,

1/ Numbers in parenthesis at the end of a sentence refer to the reference number in the Bibliography (Appendix F).

with the least amount received in August. The average frost-free period of 235 days extends from March 19 through November 10. The average seasonal temperatures range from a high of 92.0 degrees Fahrenheit in the summer to a low of 34.4 degrees Fahrenheit in the winter. The mean annual temperature is 63.5 degrees Fahrenheit. The extreme recorded temperatures are 114 degrees Fahrenheit and 11 degrees below zero Fahrenheit.

Water for domestic use is supplied largely from wells. Water is pumped from the Woodbine sand and Red River alluvium sand at depths ranging from 15 to 200 feet. Some of the more shallow wells go dry during extended drouth periods.

Present land use of the watershed is: cropland (1,646 acres) 10 percent; range (4,350 acres) 27 percent; tame pasture (6,405 acres) 40 percent; forestland (2,727 acres) 17 percent (nearly all of this wooded area is used for grazing purposes); and miscellaneous (852 acres) 6 percent.

There are about 1,535 acres of wetlands in the watershed as described in USDI Circular 39. The wetlands are divided as follows:

- Type I - Seasonally flooded basins or flats, 1,300 acres.
- Type II - Inland fresh meadows, 200 acres.
- Type V - Inland open fresh water, 35 acres.

The streams in the watershed have been so intermittent in nature that there has been no known testing for water quality. The stream water in this general area is of good quality for both municipal use and irrigation except for Little River in the vicinity of Idabel and the Red River (1). There is no reason that stream water quality within the watershed should not also be of good quality.

## 2. Present and Projected Population

In 1970, about 70 percent of the McCurtain County population was classed as rural. A projection of the rural population density of 11 people per square mile, places the population of the watershed at about 275 people.

The anticipated population for this area by the year 2020 is estimated to be approximately 300 (3). It is estimated that the population per square mile in the watershed will exceed the county average by at least 50 percent.

It is estimated that about 53 percent of the present population realizes less than \$2,500 per year from gross farm income (2). About 10 percent of the watershed population is classified as a minority group.

### 3. Economic Resources

All of the land within the watershed is considered rural and is privately owned. The sale of livestock and livestock products is a major source of agricultural income. Other important sources of agricultural income are from the sales of soybeans and cotton. In 1969, the total sale of all agricultural products sold in McCurtain County amount to \$8,569,000. Of this total, livestock accounted for \$7,274,000, and crops, \$1,217,000 (2).

There are approximately sixty farms in the watershed. In the upland area, farms range in size from 10 to 1,000 acres. In the bottom land area, the range in size is from 80 to 400 acres. The average land values range from about \$75 per acre for upland to \$500 per acre for well drained bottom land.

County census data which are also descriptive of trends in the watershed are as follows (2):

<u>Item</u>	<u>1964</u>	<u>1969</u>
All farms (number)	1,973	1,142
Average size of all farms (acres)	190	290
Value of land and buildings		
Average per farm	\$21,668	\$50,728
Average per acre	\$ 114	\$ 181
Farm with sales of \$2,500 and over,		
Economic Class 1-5, No.	326	537
Average size of farms in		
Economic Class 1-5, (acres)	563	444
Percent of tenancy	14	6
Average age of farm operators	52	52

The principal land use of the watershed upland is pasture, improved and unimproved. Improved pastures consist generally of bermudagrass, fescue, and clovers. Some improved pastures are used for hay production. The primary bottom land crops with their respective average yields per acre are: soybeans, 30 bushels; cotton, 650 pounds; alfalfa, 3.5 tons; and pasture, 225 pounds of beef.

Fescue is the principal pasture crop due to the wet and poorly drained soils. Bermudagrass, fescue, and clovers are grown in varying combinations, dependent upon soil characteristics.

The existing system of County and State roads and highways is adequate for farm and market accessibility. State highways 98 and 37, which serve the watershed are hard surfaced and provide ready access to markets in both Texas and Oklahoma. Most of the county roads are gravelled.

The watershed is in the Ouachita Mountains Resource Conservation and Development Project Area. As late as May 1973, Idabel, the county seat of McCurtain County and the principal urban area in the county, was classified as an area of substantial unemployment. This is an area with an unemployment rate of 6 percent or more.

The only income producing industry within the watershed is agriculture. However, many residents of the watershed work outside the area. The principal off-farm employment is in forest and wood processing industries.

The watershed is in the Bureau of Economic Analysis, Economic Area 131. This analysis is a summary of regional economic activity in the United States. Area 131 covers the two southeastern counties in Oklahoma, the northeastern counties in Texas, and the seven southwestern counties in Arkansas. The per capita income for this area in 1969 was \$2,491. The projected per capita income for 1980 is \$3,644 (3).

#### 4. Fish and Wildlife Resources

Upland wildlife habitat occurs in a narrow band intermittently along a three-mile segment of the upper reaches of McKinney Creek. The habitat consists of woody plants such as elm, ash, hackberry, and black willow. Shrubby vegetation mainly benefits squirrels, rabbits, quail and songbirds. This existing habitat is enhanced where grain-producing cropland borders the natural vegetation. The woody vegetation is interrupted by completely cleared areas where only a few grasses and forbs occur.

McKinney Creek is a natural ephemeral stream with no sustained fishery value. A 35-acre river cutoff lake (McKinney Lake) is located at the mouth of the creek and has a significant fishery value. It has a maximum depth of 9 feet. The water quality is suitable for fish production. Fish species present are flathead and channel catfish, carp, buffalo, crappie, gar, and a variety of sunfish. Waterfowl make some use of this lake for feeding and resting areas during the migration seasons and aquatic mammals utilize this habitat area. A beaver colony has also established in this lake and maintain the dam.

The segment of Buzzard Creek below the proposed floodwater retarding structure flows through an area of hardwood timber

consisting of elm, ash, hackberry, and box elder. This is moderate quality habitat for deer, squirrel, swamp rabbit, furbearers and a wide variety of songbirds. A few small holes of standing water along the stream have a potential for wood duck brooding areas. There is no significant fishery value in this segment.

The lower segment is about two miles long. The upper one-mile section is bordered by cropland and pastures. The lower section flows through about one mile of timber consisting of winged elm, hawthorn, Osage orange, and hackberry. This is moderate habitat for deer, squirrel, swamp rabbit, furbearers and a wide variety of songbirds. There is no significant fishery value in this segment.

The drainage area above the proposed floodwater retarding structure is approximately 7,650 acres. About 40 percent of this area has a woody cover consisting of winged elm and hawthorn. The cover is well interspersed with crop fields and tame pastures and provides a diversified habitat with a great deal of desirable edge. This is good quality habitat for deer, squirrel, cottontail, quail, furbearers, dove and songbirds; yet, deer populations are lower than carrying capacity. The impoundment is located in this type habitat with approximately 70 percent canopy cover.

Soil sediment is a significant pollutant affecting the fishery resource only during periods of heavy rainfall and flooding. This pollution becomes more significant during periods when crop fields are devoid of vegetative cover. There are no other known pollutants affecting fish in this watershed. Access to the fish and wildlife resources is usually available by request from the landowner or operator.

## 5. Recreational Resources

Several relatively large developments providing public recreational facilities are within a range of 10 to 40 miles of the watershed. Some of these developments are: Pine Creek Reservoir, Raymond Gary Recreational Area, Beavers Bend State Park, Broken Bow Reservoir, and the 50,000 acre District of the Ouachita National Forest. The recreational areas at these developments are in demand by vacationers from distant and local areas. Adequate access is available to all recreational areas. In addition to the above mentioned developments, waterbased recreational possibilities are available along several live streams and various cut-off lakes.



## 6. Archeological, Historical, and Unique Scenic Resources

An archeological assessment of the watershed area was made by Archeological Research Associates of Tulsa, Oklahoma. Five archeological sites were found, four in the vicinity of McKinney Creek and one near Buzzard Creek. None of the sites were of sufficient importance to warrant nomination to the National Register of Historic Places. One site was historic and was of too recent origin to warrant any further work.

Three of the prehistoric sites are located west of State Highway 37 near the upper end of McKinney Creek. The other prehistoric site is on Buzzard Creek and is not close to the construction area.

A check of the National Register of Historic Places and the latest edition of the Oklahoma Historical Society's "Annual Preservation Program" revealed no historical sites within the watershed (6). No sites other than those mentioned above were identified during planning, and consultation with the State Historic Preservation Officer revealed no historical sites in the project area.

## 7. Soil, Water, and Plant Management Status

Land use in the watershed has changed greatly in the past 30 years and is still changing. Small farms are being combined into larger units which are more practical to farm with todays modern equipment.

Many small upland farms were once intensively cultivated. Much of this land was marginal and should never have been removed from permanent vegetation. Severe erosion on most of the upland eventually resulted in a serious loss of top soil with an accompanying loss in soil fertility and lower crop yields. Gradually these areas were either abandoned or converted to tame pasture, or in some areas, improved woodland. The pasture and tree planting occurred gradually over a period of years due to a lack of money for capital improvements. Even today abandoned cropland with inadequate cover continues to be a source of sediment which causes damage in the bottom land. Very little upland is still in cultivation. Present owners and operators are stressing pasture management and are planting improved pastures on these old cultivated areas as fast as current economics will allow.

The bottom land area is composed of inherently fertile soils. In the past, much of the bottom land was in cultivation and a large area of this land is still in cultivation. However, many areas which were once farmed have become too wet due to inadequate drainage. Sediment from the eroding uplands gradually filled stream channels and drainageways in the bottom land until the drainage became inadequate in many areas. As this land became too wet to farm it was gradually converted to tame pasture. When it was discovered

that Tall Fescue would grow well on wet lands, much of the timber on the inherently wet soils described earlier and other wet areas, was cleared and planted to fescue and clovers.

The Valliant Conservation District has assisted, and will continue to assist, landowners and operators in the watershed. Within the watershed boundaries, there are presently 49 district cooperators with 54 conservation plans. Approximately 94 percent of the watershed area is included in conservation plans. About 75 percent of the practices planned have been applied. About 1,900 acres of cropland, 3,702 acres of tame pasture, 1,350 acres of native rangeland, and 100 acres of woodland are still scheduled to receive some form of land treatment.

The Oklahoma State University Extension program and the high school Vocational Agriculture program are also stressing proper land use and pasture management programs through the 4-H and FFA groups in the watershed. Both of these groups also help with adult education in these fields.

#### 8. Projects of Other Agencies

There are no known projects of other agencies in, or planned for, the project area.



## WATER AND RELATED LAND RESOURCE PROBLEMS

### 1. Land and Water Management

The major land management problem in the watershed is the lack of adequate drainage. In most years, planting must be delayed until early summer when the dry season starts. Attempts to plow too early when the soil is wet have resulted in the destruction of soil structure and poor soil tilth. Planting late often results in poor stands. Flowering and seed set occurs during the seasonal dry period when blooms are often dropped and fewer seeds are formed. Shrunken and light weight seed result. The overall quality and quantity of most field crops are reduced.

A second land management problem in the watershed is flooding. If the flooding occurs in the spring, planting is delayed. If it occurs later in the summer, or fall, the crop is destroyed or severely damaged and harvests are delayed.

A third problem is the inadequate vegetative cover on abandoned cropland in the uplands.

The inefficient use of committed factors of production is very evident in this watershed. Production costs remain the same regardless of yield. In some areas production of crops or pastures is extremely limited or non-existent. Taxes are paid each year on acres which produce very little, if any, income.

Labor could be more efficiently utilized if the wet areas could be made productive. If these areas were productive, a larger labor force would be required and this would affect community development and local businesses.

Because of these limitations, many farmers and ranchers have a very low return on their investment. Consequently, they are unable to make needed improvements even though they realize that they will benefit by them. Some farmers who have installed on-farm drainage systems have failed to benefit because the systems do not have an adequate outlet and do not function properly.

### 2. Floodwater Damage

Significant flooding occurs when 3.5 inches of rain falls in a 24-hour period. This amount of rainfall can be expected to occur annually. About 9.7 inches falling in a 24-hour period is expected to occur every 100 years (8).

There are three floodwater damage evaluation reaches in the watershed. Reach numbers 1 and 2 include the McKinney Creek drainage area where damages occur from both flooding and inadequate land drainage. Reach number 3 includes the Buzzard Creek drainage area

which has bottom land floodwater damage only (see Project Map). The 100-year frequency storm inundates approximately 300 acres of the Buzzard Creek bottom land below the proposed structure. Reaches 1 and 2 contain 1,500 acres of wetland that have inseparable floodwater and drainage problems.

The floodwater and drainage problems of McKinney Creek are increased as a result of floodwater from Buzzard Creek breaking over into McKinney Creek. This flood hazard is increased when the Buzzard Creek flow into Red River is held back during periods of Red River flooding. Storm flows from Buzzard Creek break over into McKinney Creek at least once each year. Some of the flows are extensive and cause significant flood damage.

The land in the Buzzard Creek flood plain is used primarily for grazing. The average annual floodwater damage to this area is estimated to be \$1,040. Average annual floodwater damages are estimated to be \$43,400 for the entire watershed.

The major crops grown in the McKinney Creek flood plain are cotton, soybeans, and tame pasture. Most floods occur in either the spring or fall and in either season damages are high. Spring floods delay planting or destroy newly seeded areas. Fall floods are particularly damaging. Cotton crops are nearly a total loss due to the staining of the cotton by sediment which greatly lowers the value of the crop which is not physically destroyed by erosion or sediment. Soybean harvests are seriously delayed and shattering and lodging is much greater on inundated plants. Yield reductions of 50 percent following flooding are not uncommon. Approximately 20 landowners in the watershed are affected by these problems.

### 3. Erosion Damage

Most of the erosion damage occurs in the uplands. The minor amount of flood plain scouring which occurs is insignificant. Upland sheet erosion causes 95 percent of the sediment production in the watershed. The remaining sediment is from roads, 2 percent; miscellaneous areas, 1 percent; and small gullies, 2 percent. There are no critical sediment source areas in the watershed. The gross erosion rate in the watershed under present conditions is about 1.1 tons per acre per year.

### 4. Sediment Damage

Although in places several feet of sediment have been deposited on the flood plain, little permanent damage has occurred. According

to local landowners, sediment along the upper portion of McKinney Creek is mostly a fertile silt that is beneficial to crop production. In the lower region near the Red River, several feet of sand have been deposited over an impervious clay layer. This sandy soil, with a shallow water table, is excellent for bermudagrass production. After the sand was deposited, the new soil was more productive than the original waterlogged clay soils.

The main damage from sediment has been due to the filling or blocking of the stream channels. After a flood in 1958, the mouth of McKinney Creek was blocked by sediment. This resulted in the formation of a 35-acre lake which has now become a permanent part of the landscape. Other sediment damage occurs when the sediment covers growing crops.

#### 5. Drainage Problems

There are 1,100 acres of deep, fine textured, slowly permeable soil and 400 acres of deep, fine textured, very slowly permeable soil along McKinney Creek which are inherently wet and require drainage. Flood waters will stand from 7 to 30 days on some of these areas. There are also 2,706 acres of inherently wet soils which require drainage for maximum production. These soils are very productive when they can be farmed.

The results of the inadequate stream channels and poor drainage outlets are explained in paragraph 1, "Land and Water Management;" of this section.

Several farmers have installed on-farm drainage systems in the past. However, the systems have been of little benefit due to inadequate outlets.

#### 6. Irrigation Problems

There is no supplemental irrigation in the watershed at the present time. Rainfall in this area is usually adequate for the crops grown in the watershed and there is little interest in developing irrigation.

#### 7. Municipal and Industrial Water Problems

The existing ground water supply is meeting the present demand for municipal and industrial water. The present supply of ground water is good and the water supply should remain adequate for the foreseeable future.

#### 8. Recreation Problems

There are several public recreational facilities within a 10 to 40 miles distance from the watershed. Adequate access is available to

all of these recreational areas. In addition, there is a 50,000 acre district of the Ouachita National Forest and several live streams and numerous cut-off lakes along the Red River that are available for recreational uses. There are about 144,000 people presently within a 50-mile radius of the watershed. Population in McCurtain County and the 2 adjoining counties in Texas has been declining over the past 10 years. The future population is expected to remain relatively stable over the next 20 years (1975-1995).

The population within a 25-mile radius is about 15,000 people. Recreational facilities open to the general public in this area include four Corps of Engineers reservoirs with recreational facilities, three State lakes with recreational facilities, a National Forest Unit with recreational facilities, several thousand acres of Weyerhaeuser Company land which is open to the public for hunting and fishing, and a State Park. There is little need for additional water-based recreational facilities in the watershed and there is little local interest in developing such facilities.

#### 9. Fish and Wildlife Problems

Land use changes which affect wildlife habitat are timber and cropland areas which are converted to improved pastures. The use of herbicides on cropland and pastures eliminates many desirable wildlife food plants.

Erosion and sediment deposition caused by flooding damages wildlife food supplies, nesting and brooding areas, and underground dens. Quail and rabbits are the animals affected most.

Sediment disrupts spawning activity of fish and the production of food in the natural food chain. Feeding habits of predator species of fishes such as black bass are hampered by the increase in turbidity of water due to flooding. Application of sound management practices for fish production is needed.

Crops and woody plantings of high value to quail, squirrel, rabbits, and deer are needed to increase the numbers of these species. Sound management of existing habitat would increase the wildlife carrying capacity.

There is only one known endangered species in the watershed area. This is the Red-cockaded woodpecker. However, since this bird exists almost entirely in short leaf pine forests, the project should have little impact on it.

Although the Southern bald eagle is known to winter around several of Oklahoma's larger reservoirs, none have been reported in the watershed area. Another endangered species, the American alligator, once was known to inhabit southeast Oklahoma. Probably never common in recent times, it too has not been reported in the watershed.

#### 10. Water Quality Problems

No known testing has been done to determine the quality of stream water in the watershed. The stream water in the general area is of good quality for both municipal use and irrigation, except Little River in the vicinity of Idabel and the Red River. In contrast to waters of the Red, tributary flows are generally low in minerals. This is evidenced by the fact that tributary inflows between Colbert, Oklahoma, and Index, Arkansas, improve the quality of river water.

In the absence of man-made influences, the geology of the area has the greatest effect on quality of streams originating in the area. As water moves over and through rocks and soils, minerals are brought into solution. The kinds and amounts of minerals depend on the availability of soluble minerals in the rock formations. In areas of relatively abundant rainfall, as in the McKinney-Buzzard Watershed, rocks and soils are well leached, and readily soluble minerals are not plentiful. Stream waters originating in the area usually have a low dissolved-mineral content, and are suitable for most beneficial uses (1).

#### 11. Economic and Social Problems

About 75 percent of the land in the McKinney Creek flood plain is operated by tenants. The flood hazard and drainage problems have a very significant effect in reducing the income potential of the operators. However, on an average, the operators of the flood plain farms are in a better financial condition than operators dependent entirely upon upland production.

Of the 1,142 farm operators in McCurtain County in 1969, 514 or 45 percent worked more than 200 days off their farms. The opportunity for much of the off farm non-agricultural and agricultural employment is seasonal. Twenty-seven percent of the 6,030 employed persons in McCurtain County in 1967 were employed in agriculture. In 1969, 274 farms reported an expenditure of \$412,000 for hired farm labor. This was an expenditure of \$1,500 per farm (5). As late as May 1973, Idabel, the county seat of McCurtain County and the principal urban area in the county, was classified as an area of substantial unemployment. This is an area with an unemployment rate of 6 percent or more.

There is a need for additional employment opportunities both within the watershed and in the nearby rural communities.

As a result of poor drainage, stagnant pools provide ideal breeding places for mosquitoes and other disease vector organisms. This situation is harmful to the health of residents and laborers within the problem area. Floods and poor drainage conditions are a

source of worry and depression for farm operators which affects their health as well as their efficiency of operation. These conditions disrupt normal farm operations, increase living expenses, add to unemployment, and delay or cancel the purchase of various products.

About 15 percent of the farms in the watershed will use one and one-half man years of labor per year.

#### RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

The proposed action does not conflict with the objectives or specific terms of approved or proposed federal, state, or local land use policies, plans, or controls.



## ENVIRONMENTAL IMPACT

A.

### CONSERVATION LAND TREATMENT

Total sediment produced from upland areas is about 18,000 tons per year. The land treatment measures will reduce this amount about 900 tons per year, or 5 percent.

Installation of farm drains is expected to result in about 1,400 acres of former cropland being returned to cultivation. This land has gradually shifted to other uses as it became too wet for farming. The present land use of this area is 475 acres of tame pasture, 550 acres of range, and 375 acres of grazed woodland.

The on-farm drainage of the wet areas in the McKinney Creek flood plain will result in an improvement of the health standards in the flood plain area. The reduction in the stagnant pools in the McKinney Creek area will prevent the hatching of many malaria carrying mosquitoes whose numbers are expected to increase dramatically in the area due to the recent prohibition of the use of DDT for insect control. The reduction in the number of these pools will also prevent the development of many other disease organisms and vector insects. This reduction in a major source of disease vectors will result in increased vitality for the population of the flood plain and adjacent areas. It will also reduce the expenses associated with health problems.

Installation of all of the land treatment measures will decrease the water runoff from the uplands about 5 percent.

The acceleration of the installation of the land treatment measures will provide a short term stimulus to the local economy. The rapid installation of these measures will result in some of the unemployed or underemployed individuals in the watershed finding employment.

The overall appearance of the watershed will be improved by the installation of the land treatment measures. Unsightly eroded areas will be vegetated and the stagnant pools and scrubby brush and weeds along McKinney Creek will be eliminated in the conversion of these areas to other uses.



About 1,500 acres of Type I and II wetlands along McKinney Creek will be properly drained. Flooding on McKinney Creek by the 100-year and 5-year frequency storms will be reduced 28 percent and 73 percent, respectively. Flooding on Buzzard Creek by storms of these intensities will be reduced by 40 percent and 70 percent, respectively.

The area which will benefit from farm drainage systems, as discussed in the "Conservation Land Treatment" section, is directly related to the structural measures. Without a channel to provide an adequate outlet for the farm drainage systems, these systems would be useless.

About 300 acres of Buzzard Creek flood plain will benefit from the project due to a reduction in flooding. This area is mostly in tame pasture and forestland used for grazing. About 1,500 acres of the McKinney Creek flood plain will benefit as a result of the project both from a reduction in flooding and from the installation of adequate drainage outlets.

The presence of 51 acres of new water surface in the area will provide a new resting and feeding place for migratory waterfowl. The number of water oriented species such as muskrat, raccoon, mink, and beaver is expected to increase in the site vicinity. The lake may also provide a new high quality fish habitat if managed properly.

Installation of the proposed project should leave water quality relatively unaffected. The floodwater retarding structure is designed to trap most of the sediment while releasing storm runoff water at a controlled rate. Consequently, water quality below the structure should be improved due to a reduction in the amount of sediment.

The quality of water in the structure will gradually deteriorate over the years as it is replaced by trapped sediment. The time required for the sediment to completely replace the water is estimated to be 50 years. After filling with sediment, the pool will have a reduced trap efficiency and will not remove as much sediment from the water as it did originally.

The flow regime of Buzzard Creek below the structure may be significantly altered. The peak flows on the stream will be greatly reduced and the duration of flows will be prolonged due to the controlled release of floodwater from the structure.

About 5.7 miles of Buzzard Creek stream channel will be affected by the project. Streamflow will be prolonged and peak flows and sediment will be reduced. The characteristics of about 5.6 miles of McKinney Creek channel will be changed. The channel will be deepened and widened. The ready removal of surface water and the improved drainage may result in this stream being converted from ephemeral to intermittent.

The flood flows from Buzzard Creek will be greatly decreased, consequently the floodwaters to McKinney Lake will be greatly reduced. This reduction in flooding will decrease the turbidity in McKinney Lake. This reduction will improve the water quality and thus improve the habitat for both aquatic and terrestrial wildlife species which utilize this permanent water source. The reduced flooding will also prevent considerable crop and pasture damage along McKinney Creek. After completion of the floodwater retarding structure, the overflows from Buzzard Creek to McKinney Creek will be eliminated except on rare occasions.

Due to the improved drainage and reduced flooding, about 375 acres of grazed woodlands, 550 acres of range, and 475 acres of tame pasture are expected to be converted to cropland when the project has been installed. The conversion of this land use from generally low quality native grasses and improved pasture to cropland species such as soybeans, alfalfa, grain sorghums, etc., will probably benefit the wildlife in the area. The standing crops, and crop aftermaths and residues, will provide a much more stable food resource. The loss of the 375 acres of woodlands will reduce the amount of cover and may result in a decrease in total wildlife numbers. However, in the vicinity of the remaining cover, the wildlife carrying capacities may be increased due to a greater and more constant food supply.

Based on available data, there will be about a 1.75 percent reduction in the amount of water reaching the mouth of the watershed. This loss will be due to evaporation from the floodwater retarding structure.

The loss of the upland habitat will initially result in the displacement of woodland wildlife species into adjacent areas. If the adjacent areas are already totally stocked with wildlife species, the displaced animals will eventually perish due to a lack of habitat.

However, if the area is understocked, at least some and possibly all of the displaced animals will be able to relocate satisfactorily. In either event, the presence of the dependable water supply in the upland area and an increase in the amount of desirable edge area will benefit the woodland wildlife species remaining in the site vicinity. The number of squirrels and wood ducks may decrease if too many nesting trees are removed.

The construction of the floodwater retarding structures will result in the destruction of about 57 acres of upland habitat and the substitution of 51 surface acres of water. Another 263 acres of grazed woodland, 148 acres of native grass, and 33 acres of tame pasture, will be inundated temporarily by floodwater during periods of heavy rainfall. In addition, about 40 acres of McKinney Creek will be involved in channel work. The sponsors have agreed to maintain 30 squirrel nesting containers and 10 wood duck nesting boxes which will be placed in the vicinity of the reservoir to mitigate the loss of habitat.

Sediment production will undergo a slight temporary increase during the construction process due to earth moving activities and the accompanying removal of vegetative cover. The structures and other disturbed areas will be vegetated for erosion control as soon as construction has been completed.

Due to project installation, the monetary output value of the crops and livestock produced in the watershed will be increased by about \$76,200 annually. An analysis of project benefits indicates that agricultural employment on a long-term basis will be increased by five people.

Economic external economies benefits, including increased business activity and improved economic conditions in the surrounding communities, will result from project installation. Laborers, processors, and suppliers, will benefit as a result of the project through the multiplier effect or change in economic activity resulting from the increased purchasing power due to increased production. Reduction of flooding and drainage problems will enable operators of benefitted land to improve their net incomes through more efficient use of equipment, fertilizer, and seed. The project will allow operators to use the land more nearly in accord with its capabilities.

The reduction of the stagnant pools which provide breeding places for malaria mosquitoes and other disease vector organisms will improve the vitality and health of people in the watershed and adjacent areas.

About 20 farm owners and operators will benefit directly from the planned project.

Average yields per acre will increase since a crop will be harvested nearly every year. The quality of the crops will be improved due to improved management practices (Optimum planting dates, adequate fertilization, proper harvest dates).

The project will leave the archeological resource of the watershed essentially unaffected and no historic sites were identified during planning that will be affected by the project.

D.

FAVORABLE ENVIRONMENTAL IMPACTS

The completed project will:

1. Reduce runoff, erosion and flooding with associated agricultural damages, directly benefitting 20 landowners and operators, and indirectly benefitting about 7,500 other people.
2. Increase crop yields and pasture feed values.
3. Stabilize family farms and increase net returns of low income operators.
4. Create employment opportunities through operation and maintenance of project measures.
5. Protect the lives of travelers, campers, and fishermen, and enable school buses and rural mail carriers to better keep their schedules.
6. Reduce the destruction of ground nesting birds and animals in the flood plain, and thus sustain more stable, permanent wildlife populations.
7. Create about 51 acres of new, high quality water habitat for fish and other wildlife.
8. Stabilize stream base flows.
9. Reduce the total sediment yield from the watershed.
10. Improve the appearance of the flood plain by replacing the stagnant pools, brush, and weeds along the McKinney Creek channel with a defined channel having vegetated banks and a pleasing appearance.
11. Convert about 1,500 acres from low intensity, low income producing uses to high intensity, high income producing uses.
12. Improve water quality below the structure.
13. Reduce turbidity in McKinney Lake.
14. Contribute to archeological knowledge through the discovery of five archeological sites which would probably not have been reported otherwise.

E.

ADVERSE ENVIRONMENTAL IMPACTS

The completed project will:

1. Reduce land available for agricultural production by about 100 acres.
2. Occasionally interrupt use of the 444 acres of land in the retarding pool area which is subject to intermittent inundation.
3. Restrict land use on about 56 acres of land needed for dams, spillways, channels, and appurtenances.
4. Decrease habitat for wildlife making their nest or den in trees, and animals utilizing timber for cover, as a result of timber clearing in the flood plain and the structure area by about 31 acres.
5. Temporarily disrupt wildlife habitat during construction of structural measures.
6. Cause localized short term increases in erosion, turbidity, sediment, noise, and dust due to the construction activities.
7. Reduce by about 1.75 percent the amount of water reaching the mouth of the watershed.

## ALTERNATIVES

The alternatives to the planned action which were considered during the planning process were: (1) an accelerated program of applying land treatment measures for watershed protection; (2) an accelerated land treatment program plus the same floodwater retarding structure found in the selected plan; (3) an accelerated land treatment program plus the same channel work found in the selected plan; and (4) an accelerated land treatment program and channel work as in the proposed plan plus a dike to prevent floodwaters from breaking over into McKinney Creek. A discussion of each alternative follows:

Alternative 1 - Accelerated land treatment alone. This alternative consisted of applying the land treatment measures proposed in the planned action. The impacts of this alternative are essentially the same as shown under the Land Treatment section of the proposed plan. This alternative will reduce upland erosion about 20 percent and flooding on Buzzard Creek about 6 percent. Drainage problems on McKinney Creek would remain essentially the same as would the damages from flooding. Under this alternative all of the structural benefits would be foregone. The estimated cost is \$274,820.

Alternative 2 - This alternative has the same accelerated land treatment program and floodwater retarding structure as the proposed plan. The impacts for the land treatment measures and the floodwater retarding structure would be the same as in the planned action. The 1,500 acres of land needing drainage would continue to have the same drainage problems under this alternative. All, or in part, of the favorable environmental impacts shown on page II-37 related to drainage (numbers 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, and 13) would be foregone. All, or in part, of the adverse environmental impacts shown on page II-38 related to drainage (numbers 1, 3, 4, 5, and 6) would also be avoided. All of the drainage benefits as shown in the selected plan would be foregone under this alternative. The cost is estimated to be \$570,080.

Alternative 3 - This alternative consists of the same land treatment program and channel work as shown in the proposed plan. This alternative would also have the same impacts for these particular measures as shown in the selected plan. However, the benefits from the channel work would only be achieved at a very high maintenance cost due to the continued flooding and sediment deposition. Following each flood, the fresh sediment which would be deposited (5,000 tons/year) would have to be removed to keep the channels functioning properly. This would be a continuing expense for both the sponsors and individual farmers who had installed on-farm drainage systems. All, or part, of the favorable environmental impacts shown on page II-37 related to the floodwater retarding structure (numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 12 and 13) would be foregone. All, or part, of the adverse environmental impacts shown on page II-38 related to the flood control structure would also be avoided (numbers 1 through 7). All benefits for the floodwater retarding structure will be foregone under this alternative. The estimated cost of this plan is \$644,160 and annual maintenance would be \$25,000.



Alternative 4 - This alternative considered the same land treatment and channel work as the proposed plan plus a dike to prevent the floodwater from Buzzard Creek from breaking over into McKinney Creek. The impacts of this land treatment and channel work will be the same as shown in the proposed plan. The dike would provide about the same reduction in floodwater damages on McKinney Creek as the floodwater retarding structures. The dike would only require about three acres of land rather than the 476 acres affected by the floodwater retarding structure. The dike would result in an increase in the severity of flooding on the Buzzard Creek flood plain. Loss of ground nesting birds and animals on Buzzard Creek flood plain would increase due to larger areas flooded and the greater depths and intensities of flooding. Sediment and scour damage would increase on Buzzard Creek and decrease on McKinney Creek. Flood damages would also increase on Buzzard Creek. Crop yields and pasture feed values will be increased on McKinney Creek and lowered on Buzzard Creek. The cost of this alternative, including the additional flowage easements on Buzzard Creek, is estimated to be \$626,920.

No project - The land treatment portion of the selected plan would have eventually been installed under "no project" conditions. However, these measures would be installed over a 15-20 year period rather than the 5-year period under the accelerated land treatment program. The delay in reducing upland erosion would result in greater sediment damage to the stream channels and the flood plain. This would result in greater damages and lower net incomes and decreased economic vitality through the region. Cropland would decrease by about 25 acres, tame pasture would increase by about 200 acres, native range would decrease by about 250 acres and wooded areas would increase by about 75 acres under no project conditions. Erosion would increase from 1 to 2 tons per acre on about 500 acres. Drainage would be inadequate on 923 acres of cropland, and 2,560 acres of tame pasture. Although the area in woodland would increase, about 80 percent of the total woodland acreage would have less than 50 percent acceptable growing stock, and nearly the same amount would be stocked at less than 50 percent density. The woodland acres would consequently be of low quality and of little economic or esthetic value. Average net annual benefits of \$19,790 would be foregone under no project conditions.



## SHORT-TERM VS. LONG-TERM USE OF RESOURCES

The land use in the watershed is primarily for agricultural production. The land use trend has been from cultivated crops to tame pasture and low quality native grasses and brushy woodland on abandoned cropland. Another noticeable trend has been from woodland to tame pasture. The projected land use, under no project conditions, is as follows:

<u>Land Use</u>	<u>Acres</u>	<u>Percent</u>
Cropland	2,600	16
Tame Pasture	6,372	40
Native Range	3,800	24
Woodland	2,231	14
Miscellaneous	977	6
	<hr/>	<hr/>
	15,980	100

The conservation land treatment program is flexible for meeting the needs of changing land uses in order to protect and improve the soil, water, and vegetative resources for the future.

The McKinney-Buzzard Creek Watershed Project is within the Red River Basin drainage area and is an integral part of the Red River Below Denison Dam Comprehensive Basin Study. The total area involved in the Red River Basin Below Denison Dam Study is about 29,610 square miles. The Basin area ranges in width from about 130 miles in the upper reaches to about 20 miles in the lower reaches and the length, measured along its major axis, is about 400 miles. Mean annual precipitation varies from about 37 inches at Denison Dam to about 59 inches at the mouth (5).

There are several Public Law 566 watershed projects in the region of the McKinney-Buzzard Watershed. Most of these projects are in various stages of completion. However, their collective influence when all are completed is expected to significantly reduce flooding in the region with all of its attendant damages and associated problems. The watershed area is so small, the planned project will have little effect on the overall region.

It is anticipated that the works of improvement in this project, along with other proposed works of improvement within the region, will have significant impacts on the quality of the human environment. The most obvious impacts of potential project development are conversions of land to water area. Existing, authorized, and potential projects would increase semi-permanent water surfaces from 289,300 acres in 1962 to 745,400 acres. The productive base for agriculture would decrease from 17,333,300 acres in 1962 to 16,782,000 acres. Part of this decrease would result from increases in land devoted to urban and small water uses. These changes, and projected major land use changes, would decrease total land treatment requirements, but would require increased use of cropland conservation practices.

The projects will contribute to meeting increased agricultural production requirements by allowing formerly flooded and poorly drained land to be farmed more intensively. Irrigation projects will increase agricultural production. The projects will result in overall economic impacts such as increased rural employment and income.

This plan provides a level of protection consistent with the needs and objectives of present and anticipated use of the flood plain lands. It provides protection for some of the most productive land in the watershed and it will aid in the orderly development of the natural resources of the area. The plan gives consideration to conservation and environmental measures to preserve the land for use by future generations. The structural measures are evaluated for a 100-year period. At the end of this period, the structures are expected to remain useful in the reduction of floodwaters.

## IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The labor, engery for construction, and a portion of the materials are totally committed resources in this project. In addition, about 57 acres of land devoted to sediment pool, and dam and spillway will be removed from agricultural production. Of this amount, 40 acres are in tame pasture and 17 acres are in timber. Agricultural production on the 444 acres involved in the detention pool area of the structure will also be restricted during periods of high water. This restriction will exist for the life of the project.

## CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

When planning activities were authorized, the Soil Conservation Service mailed an announcement in September 1968 to all concerned Federal and State agencies that a watershed plan was to be developed for the McKinney-Buzzard Creek Watershed. The announcement invited each agency to participate and make contributions to the plan. A biological reconnaissance of the watershed was made by personnel from the Oklahoma Department of Wildlife Conservation, U.S. Fish and Wildlife Service, and the Soil Conservation Service. Wildlife habitat considerations discussed in the biological reconnaissance report were included in work plan development.

A public hearing was scheduled to present the proposed plans, answer questions, and inform the public that all suggestions and comments should be submitted in writing to the local sponsoring organization. Invitations to attend the public hearing were mailed directly to one county, one state, and 2 federal agencies, and 30 landowners and operators.

A notice of the meeting also appeared in the Valliant Challenger newspaper on November 30, 1972. Representatives from two state and one federal agency, and four landowners were present at the public hearing on December 5, 1972.

At this meeting, a large watershed map showing the location of each structural measure was displayed. Each location was discussed individually and comments were requested. The participants were informed that protests would be accepted verbally or by mail. No protests against this proposed plan have been received.

This plan is an integral part of the Comprehensive Basin Study of the Red River Below Denison Dam. The proposals made by the study for this watershed have been incorporated in the works of improvement.

During the formulation of this project, discussions were held with the local sponsors and landowners of site locations about water quality, sanitation, and recreation.

Displacement of people, businesses, and farm operations were discussed with sponsors and site committee's during project formulation and every effort was made to prevent any type of displacement.

The state archeologist, state historic preservation officer, and the director of the Historic Sites Division of the Oklahoma Historical Society were consulted during the assessment of the archeological and historical resources. Continued consultation and cooperation with these individuals, and the archeologists employed by the Oklahoma Conservation Commission, will be pursued through the final installation phases of the project.

The Secretary of the Interior will be informed of any archeological or historical values found during the installation phases of the project to insure that appropriate action will be taken.

#### DISCUSSION AND DISPOSITION OF EACH COMMENT MADE ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT CONCERNING ENVIRONMENTAL ISSUES

Written comments were requested from the following agencies: 1/

Department of the Army  
Department of Commerce (R)  
Department of Health, Education, and Welfare (R)  
Department of the Interior (R)  
Department of Transportation (R)  
Environmental Protection Agency (R)  
Advisory Council on Historic Preservation  
Office of Equal Opportunity, USDA  
Federal Power Commission  
Oklahoma Historic Preservation Officer  
National Resources Defense Council  
Governor of Oklahoma (R)  
State Clearinghouse  
Regional Clearinghouse  
Friends of the Earth  
Environmental Defense Fund  
National Wildlife Federation  
National Audubon Society

1/ R = Response

Environmental Impact Assessment Project  
Isaac Walton League, Oklahoma Chapter  
Sierra Club, Oklahoma Chapter  
Oklahoma Wildlife Federation  
Tulsa Audubon Society

The summarization and a response is provided for each environmental issue, problem, or objection raised during the formal review of the Draft Watershed Plan and Draft Environmental Impact Statement follows:

UNITED STATES DEPARTMENT OF COMMERCE (National Oceanic and Atmospheric Administration)

Comment 1: They felt the paragraph on climate would be improved if the frequency, intensity, and type of storm which produces flooding were discussed.

Response: The section concerning watershed problems has been expanded to provide additional information concerning rainfall frequencies and flooding.

Comment 2: The mean seasonal temperatures on page II-19 are questioned.

Response: These figures have been corrected in the final draft.

GOVERNOR OF OKLAHOMA (Oklahoma Conservation Commission)

Comment: No adverse environmental impact is anticipated for this plan. We are not opposed to this project.

Response: Noted.

DEPARTMENT OF TRANSPORTATION

Comment: They had reviewed the material submitted and had no comments to offer nor did they object to the project.

Response: Noted.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Comment: They could discern no adverse effects that might be of significance and had no objection to the project.

Response: Noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Comment 1: They classified the Draft Environmental Impact Statement as LO-1.

Response: Noted.

Comment 2: They had no objection to the project as proposed.

Response: Noted.

Comment 3: The Draft Watershed Plan and Environmental Impact Statement contained sufficient information to evaluate the project's impact upon the environment.

Response: Noted.

UNITED STATES DEPARTMENT OF THE INTERIOR (Watershed Work Plan)

Comment 1: It was noted that \$5,600 of average annual benefits attributable to flood prevention and drainage would result from the project. It appears to the USDI that the monetary benefits gained by draining the Type I and II wetlands may not be commensurate with the environmental degradation imposed upon the wetlands.

Response: The 1,500 acres of Type I and II wetlands that will be drained are marginal in wetland value. Most of the areas are plowed annually and no aquatic vegetation is established. Many years these areas are treated just like the adjacent cropland and crops are harvested from them. Other years the crops are planted later, or harvested later than surrounding fields, but the wet areas are still used as cropland. With the drainage, more intensive cropping will occur and desirable food species for most species of wildlife will be grown. The impacts of this drainage are described in paragraph 3 page II-32, and II-36, and number 10 page II-37.

Comment 2: Page I-10, paragraph 2.a. Perhaps the wording could be altered for clarification to read, "...Structure will be installed on Buzzard Creek to protect flood plain ..".

Response: This change has been made in the final draft.

Comment 3: Page I-11, paragraph 2.b. Perhaps the wording could be altered for clarification to read, "...appurtenant structures are planned for the McKinney Creek Watershed (see project map)."

Response: The sentence has been changed to improve clarity.

Comment 4: Page I-11, paragraph 2.c. Explicit plans for the establishment and project-life maintenance of mitigatory strip plantings should be provided for conformance with Watershed Protection Handbook 101.3141.

Response: For funding purposes, wildlife mitigation measures are considered a part of the structural measures. Detailed planting plans will be developed during the design and construction phases of the project, and the installation of these measures will normally be contracted at the same time as the vegetation contracts are let. Since mitigation plantings are considered structural measures for contractual purposes, maintenance of these measures is assured under the terms of the agreement between the Service and the sponsors. Wildlife habitat plantings of not less than five acres nor more than seven acres (depending on final design) will be installed along the channel. Tree species included in the plantings will be Red Oak, Water Oak, Green Ash, Maple, and Red Bud. Shrubs will include Autumn Olive, Russian Olive, and Multiflora Rose. Cover plantings around trees and shrubs will include such species as Kanlow Switchgrass, and Bahia Grass. These plantings will be located as close as possible to the areas where habitat is destroyed.

#### Environmental Impact Statement

Comment 1: The USDI felt that information should be provided in the EIS on foundation conditions at the dam site, borrow material to be used in the structure and the relationship of some of the geologic formations to the site.

Response: This portion of the EIS has been expanded to provide this information.

Comment 2: The comment stated that impacts on groundwater should be more explicitly considered. Particular questions were asked concerning the magnitude of lowering the water table and the effects on well water supplies. It was stated that groundwater impacts should be considered in the treatment of alternatives.

Response: The areas to be drained hold water due to impervious clay layers just beneath the surface soil profiles. This water is called "soil water" and normally does not reach sufficient depths to be considered groundwater. Consequently, the project would not affect the status of groundwater in the project area.



Comment 3: A better description was desired of the projects effects upon wetlands and their associated wildlife resources.

Response: The final draft has been modified to provide a better description. As stated in the response to comment 1 on page II-46, these wetland areas are treated as cropland, or used for other agricultural purposes, during most years.

Comment 4: It was felt that rights-of-way requirements for excavation, soil spreading, roads, and maintenance that are provided on rights-of-way maps should be shown in the EIS and that mitigation is inadequately defined and that these measures should be explicitly detailed and assured.

Response: The approximate acreages of rights-of-way requirements have been clearly stated in the EIS and the affects of these impacts have been discussed. As stated in the response to comment 4 on page II-47, the mitigation measures will be properly installed and maintained due to requirements of the Work Plan Agreement.

Comment 5: The total watershed acreages should be provided in the last paragraph on page II-8 and the 2,095 acres which drain directly into the Red River should be discussed to properly show the structural capability for flood control.

Response: This paragraph has been modified to show the acres in the watershed and to show the percent control when the land draining directly into the Red River is taken into consideration.

Comment 6: The vegetation presently occupying the six acres of dam and spillway area should be shown in paragraph six page II-9.

Response: This information has been added.

Comment 7: The function of the departure from the natural channel in Reach 1 should be explained and its environmental impacts discussed.

Response: The natural channel in Reach 1 makes several sharp bends or loops. Following the natural channel would greatly increase the cost of the project due to the added length. Where the new channel cuts across these bends, McKinney Creek will actually have two channels, the new straight channel and the old curved section. Nearly all of this area is presently a bermudagrass pasture. About the only environmental impact associated with the channel straightening is the reduction of agricultural land, and this has been discussed in the EIS.



Comment 8: The second sentence of the first paragraph on page II-10 is not clear. This statement is reiterated in part I and should also be clarified there.

Response: This paragraph has been revised in both Part I and Part II to improve the clarity.

Comment 9: The manner in which the channel will be enlarged without encroachment on existing vegetation should be explained.

Response: This 800-foot section described on page II-10 is an area immediately adjacent to the highway bridge. When the bridge was installed several years ago, the channel was widened a short distance above and below the bridge. The new channel will be much narrower in this region and will be completely installed within the present channel area.

Comment 10: Construction from one side of the channel should be discussed in conjunction with the comment on page I-23 which states that a travelway should be provided on each side of large channels if necessary for use of maintenance equipment.

Response: Some channels may be too wide for a standard dragline to reach all the way across, consequently, they must be able to operate from both sides. However, the planned channel in this project is not big enough to need more than the single maintenance roadway.

Comment 11: The statement that, "The location of the channels on the project map is approximate" on page II-10 requires some elaboration. The extent of required flexibility should be defined, particularly as it may relate to the northern and southern extremities.

Response: The starting and ending points will be about as shown on the project map. The exact location of the channels will be based on the final design of the channel. This design will be modified wherever possible to avoid the better wildlife habitat areas.

Comment 12: The species and acreage of the mitigated wildlife habitat plantings along McKinney Creek should be disclosed.

Response: As stated in the response to general comment 4 on page II-47, not less than 5 acres nor more than 7 acres of habitat plantings will be made. The species used are also shown on page II-47.

Comment 13: The statement on page II-12 that "a biologist and a forester should flag the trees to be saved" in reference to large or mast-bearing trees along the channel is non-committal and the assignment of responsibility should be included.

Response: The statement has been changed from "should flag the trees" to "will flag the trees".

Comment 14: The plant species of benefit to the game species favored should be disclosed for the habitat planting in the site area.

Response: This information is provided in the response to general comment 4 on page II-47.

Comment 15: Fencing of the habitat plantings should be provided and assured.

Response: Fencing is a standard part of the design on all habitat plantings.

Comment 16: Doesn't the McKinney Creek depression extend southeastward rather than southwestward as stated on page II-16?

Response: The final statement has been changed to southeastward.

Comment 17: The wetland areas referred to on page II-19 should be discussed in the Fish and Wildlife Resources section.

Response: See response to Watershed Work Plan comment 1 and EIS comment 3 for comments concerning the Type I and II wetlands. The Type V wetlands are discussed in some detail in the Wildlife Resources section on Page II-21.

Comment 18: On pages II-19 and 29 statements concerning water quality are questioned and a suggested change is given.

Response: These paragraphs have been modified to make their meaning clearer.

Comment 19: The statement on page II-22 that wildlife populations in the drainage area above the floodwater retarding structure are lower than carrying capacity is questioned. Perhaps some substantiating documentation of this is in order.

Response: A Biological Reconnaissance Report made by two representatives from the U. S. Fish and Wildlife Service, one representative from the Oklahoma Department of Wildlife Conservation, an SCS Biologist, and three other SCS representatives including the District Conservationist, states, "Deer populations in the area are low due to factors other than habitat quality." Perhaps our assumption that if deer populations were below carrying capacity, other species would probably be below carrying capacity also, is too broad. Consequently, the word wildlife in the questioned statement has been changed to deer.

Comment 20: The number of archeological sites in the area is confusing and two specific pages are referenced.

Response: Paragraph 1 and 2 of the Archeological and Historical section on page II-23 has been revised for greater clarity, and an additional statement on page II-11 has been added.

Comment 21: The statement on page II-33 that, "The lake may also provide a new high quality fish habitat if managed properly" lacks the conviction implied elsewhere in the statement. It is stated without condition on page II-5, that the sediment pool will be managed under the "... going and accelerated programs in conjunction with the Oklahoma Department of Wildlife Conservation." If assured management is determined, the program should be described.

Response: The statement on page II-5 has been changed. The management of the structure is determined strictly by the landowner who has given the easement for its construction. The landowner may, or may not, manage the lake for fish and wildlife.

Comment 22: The statement on page II-34 that channelization of McKinney Creek may result in this stream being converted from ephemeral to intermittent is not clear. The statement should be better explained or deleted.

Response: There are 1,500 acres of land along McKinney Creek which are "inherently wet". That is, the soil structure is such that internal drainage occurs at a slow rate. This internal drainage problem is compounded by two other problems: (1) the flat, hummocky, topography results in many small areas where water is ponded, and (2) a lack of an outlet for the water immediately below the surface which moves through the soil profile.

Internal drainage of the soil profile is a complex matter. Present technical information which is available shows that the slow internal drainage, along with the improved surface drainage may result in the change stated on page II-34. For a better understanding of the principles involved, we recommend the section on Soil Moisture which starts on page 49 of the 1957 USDA Yearbook of Agriculture (Soil).

When the channel system is installed, the ponded surface water will be able to escape, thus reducing the pressure which now tends to force water into the soil. In addition, the depth of the channels will provide an outlet for the soil water.

The combination of the improved surface drainage and the soil drainage, which will occur slowly over a period of days following a wet spell, could extend the period of flow in the main McKinney Creek channel enough for it to be classified as intermittent rather than ephemeral.

Comment 23: It is stated on page II-34 that a reduction in flooding will improve the water quality of McKinney Lake. Apparently the severe erosion that may develop in the silty sand reach discussed on page II-10 was not considered.

Response: The major pollutant from flood waters is clay particles which remain in suspension almost indefinitely and thus greatly increase turbidity and lower water quality. These particles will be trapped by the floodwater retarding structure and will not reach McKinney Lake. If erosion occurs on the lower reaches of the channel, the major pollutant will be sand. The sand particles are heavy and will settle out quite rapidly with very little increased turbidity.

Comment 24: It is stated on page II-34 that a reduction in flooding will improve the water quality of McKinney Lake. Apparently the severe erosion that may develop in the silty sand reach discussed on page II-10 was not considered.

Response: The major pollutant from flood waters is clay particles which remain in suspension almost indefinitely and thus greatly increase turbidity and lower water quality. These particles will be trapped by the floodwater retarding structures and will not reach McKinney Lake. If erosion occurs on the lower reaches of the channel, the major pollutant will be sand. The sand particles are heavy and will settle out quite rapidly with very little increased turbidity.

Comment 25: The prevailing drainage to McKinney Lake should be described and present flows contrasted with flows that may result from project implementation.

Response: The description of drainage and flows to McKinney Lake have been modified to improve clarity.

Comment 26: As described on page II-34, the loss of 375 acres of woodlands to agriculture is an adverse impact to wildlife resources. The exchange of acres of woodland for acres of agricultural production does not improve wildlife habitat. Further, it is not likely that the wildlife carrying capacities will be increased in the vicinity of the remaining cover due to a greater and most constant food supply.

Response: It is true that the projected loss of 375 acres of woodland will have a detrimental effect on wildlife. However, considering the reduction of flooding on the flood plain and the addition of desirable domestic food species, the remaining habitat unit value should be increased.

Comment 27: Based on Table 1 on page 1-25 of the work plan, alternatives 2 and 3 do not appear to have included any costs for administration, land rights, water rights, or others. These costs would seem to be appropriately charged to alternates and would make the alternates even less desirable.

Response: The final draft has been changed to include these costs.



LIST OF APPENDICES

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Project Map

Appendix C - Letters of Comment Received on the Draft Environmental Statement.

Appendix D - Typical Pipe Drop Structure

Appendix E - Flood Hazard Analysis Map

Appendix F - Bibliography

Approved by:

A handwritten signature in dark ink, appearing to read "Robert L. Miller", is written over a horizontal line.

Date:

MAY 7, 1976





# APPENDIX A - COMPARISON OF BENEFITS AND COSTS

McKinney-Buzzard Creek Watershed, Oklahoma  
(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS 1/				Average : Benefit	
	:Flood Prevention:Agri.	Water Mgn.: Employ- :Damage Reduction: Drainage	ment	:Economies: Total	: Annual : Cost	: Cost 2/ : Ratio
Floodwater Retarding Structure No. 1, Channel Work, and Appurtenant Structures	39,700	5,600	3,570	10,940	59,810	36,617 1.6:1
Project Administration						5,496
GRAND TOTAL	39,700	5,600	3,570	10,940	59,810	42,113 1.4:1

- 1/ Price Base: Crop and pasture benefits, current normalized prices,  
February 1974.  
2/ Installation 1975 prices amortized for 100-years at 6.125 percent interest.  
Operation and maintenance, 1975 prices.

December 1975





0 1 2  
APPROXIMATE SCALE - MILES

4-R-33429-A  
4-R-2710B



## APPENDIX C

### COMMENTS





DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY  
WASHINGTON, D.C. 20310

VALERIO	1	
1		

*File*

Honorable Robert W. Long  
Assistant Secretary of Agriculture  
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the State Conservationist, on behalf of the Administrator of the Soil Conservation Service, by letter dated 22 December 1975, requested the views of the Secretary of the Army on the Watershed Work Plan and Draft Environmental Statement for McKinney-Buzzard Creek Watershed, McCurtain County, Oklahoma.

We have reviewed the work plan and ~~foresee~~ no conflict with any projects or current proposals of this Department. The Draft Environmental Statement is considered to be satisfactory.

Sincerely,

Charles R. Ford  
Deputy Assistant Secretary of the Army  
(Civil Works)









10-1-1976  
UNITED STATES DEPARTMENT OF COMMERCE  
The Assistant Secretary for Science and Technology  
Washington, D.C. 20230

February 26, 1976

*[Handwritten signature]*  
1-

Mr. Roland R. Willis  
State Conservationist  
Soil Conservation Service  
State Office  
Stillwater, Oklahoma 74074

Dear Mr. Willis:

This is in reference to your draft environmental impact statement entitled "McKinney-Buzzard Creek Watershed, Oklahoma." The enclosed comments from the National Oceanic and Atmospheric Administration are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving four (4) copies of the final statement.

Sincerely,

*[Handwritten signature of Sidney R. Galler]*

Sidney R. Galler  
Deputy Assistant Secretary  
for Environmental Affairs

Enclosure - Memo from Environmental Data Service, January 19, 1976





U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
ENVIRONMENTAL DATA SERVICE  
Washington, D.C. 20235

January 15, 1976

Dx61/DLEC JAN 19 1976

TO: William Aron  
Director, Office of Ecology and Environmental Conservation, EE

FROM: *Douglas LeComte*  
Douglas LeComte  
Special Projects

SUBJECT: EDS Review of DEIS 7601.02 (McKinney-Buzzard Creek Watershed)

The EDS has reviewed the subject DEIS and offers the following comments:

General Comments:

A major purpose of the project is flood control; yet there is no information on the weather systems that cause flooding. The paragraph on climate would be improved if the frequency, intensity, and type of storm which produces flooding were discussed. Data on extreme rainfall amounts would also be helpful. U.S. Weather Bureau Technical Paper No. 40 is a useful source for data on the frequency of extreme rainfall amounts. It indicates, for instance, that a 24-hour rainfall of 3.5 inches would have a return period of 1 year, 6.5 inches every 10 years, and 8.5 inches every 50 years in the McKinney-Buzzard Creek Watershed. Additional climatic information is available from the National Climatic Center, Asheville, North Carolina 28801.

Specific Comments:

Page II-19, 1st paragraph: It is stated that the "mean seasonal temperatures range from 95.5 degrees Fahrenheit in the summer to 32.8 degrees Fahrenheit in the winter." Apparently these figures actually refer to the normal daily maximum temperature in July and the normal daily minimum temperature in January, respectively. Mean seasonal temperatures actually range from about 80 degrees to about 44 degrees in summer and winter in this area (Environmental Data Service's Climatic Atlas of the United States, 1968).

LEONARD A. SOLOMON  
Executive Director

*Handwritten signature*  
CLIFFORD  
Assistant Director

OKLAHOMA CONSERVATION COMMISSION

20 STATE CAPITOL BUILDING  
OKLAHOMA CITY, OKLAHOMA 73105  
PHONE 521-2384

February 3, 1976

Mr. Roland R. Willis, SCS  
State Conservationist  
State Office  
Stillwater, Oklahoma 74074

Dear Mr. Willis:

We are in receipt of your letter dated December 22, 1975, to Governor David Hall in regard to the plan for the McKinney-Buzzard Creek Watershed, Oklahoma.

No adverse environmental impact is anticipated for this plan.  
We are not opposed to this project.

Sincerely,

*Handwritten signature*  
CLIFFORD W. LECATE  
Assistant Director

CML/pal



DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

MAILING ADDRESS G-WC/73  
U. S. COAST GUARD  
WASHINGTON, D.C. 20590  
PHONE: (202) 426-2262

. 10 Feb 76

Mr. Roland R. Willis  
State Conservationist  
Soil Conservation Service  
State Office  
Stillwater, Oklahoma 74074

Dear Mr. Willis:

This is in response to your letter of 22 December 1975 addressed to the Commandant, U. S. Coast Guard concerning a draft environmental statement for McKinney-Buzzard Creek Watershed, McCurtain County, Oklahoma.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

D. J. RILEY  
Captain, U. S. Coast Guard  
Deputy Chief, Office of  
Environment and Safety  
Direction of the USCG



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGIONAL OFFICE

1114 COMMERCE STREET  
DALLAS, TEXAS 75202

OFFICE OF  
THE REGIONAL DIRECTOR

February 13, 1976

Our Reference: EI# 0176-655  
McKinney-Buzzard Creek Watershed

Mr. Roland R. Willis  
State Conservationist  
United States Department of Agriculture  
Soil Conservation Service  
Stillwater, Oklahoma 74074

Dear Mr. Willis:

Pursuant to your request, we have reviewed the Environmental Impact Statement for the above project proposal in accordance with Section 102(2)(C) of P.L. 91-190, and the Council on Environmental Quality Guidelines of April 23, 1971.

Environmental health program responsibilities and standards of the Department of Health, Education, and Welfare include those vested with the United States Public Health Service and the Facilities Engineering and Construction Agency. The U.S. Public Health Service has those programs of the Federal Food and Drug Administration, which include the National Institute of Occupational Safety and Health and the Bureau of Community Environmental Management (housing, injury control, recreational health and insect and rodent control).

Accordingly, our review of the Draft Environmental Statement for the project discerns no adverse effects that might be of significance where our program responsibilities and standards pertain, provided that appropriate guides are followed in concert with State, County, and local environmental health laws and regulations.

We therefore have no objection to the authorization of this project insofar as our interests and responsibilities are concerned.

Sincerely,

D. Dean Blue  
Regional Environmental Officer  
Facilities Engineering  
and Construction



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI  
1600 PATTERSON  
DALLAS, TEXAS 75201

February 19, 1976

Mr. Roland R. Willis  
State Conservationist  
United States Department of Agriculture  
Soil Conservation Service  
State Office  
Stillwater, Oklahoma 74074.

Dear Mr. Willis:

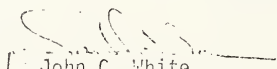
We have reviewed the Draft Environmental Impact Statement and Watershed Work Plan for McKinney-Buzzard Creek Watershed, McCurtain County, Oklahoma. The proposed action calls for the installation of land treatment measures, construction of one floodwater retarding structure and 9.2 miles of multiple-purpose channel work with appurtenant structures.

This classifies your Draft Environmental Impact Statement as LO-1. Generally, we have no objection to the project as proposed. The Draft Environmental Impact Statement and Watershed Work Plan contained sufficient information to evaluate the project's impact upon the environment. The classification and the date of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the attachment. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and on the adequacy of the impact statement at the draft stage, whenever possible.

We appreciate the opportunity to review the Draft Environmental Impact Statement. Please send us two copies of the Final Environmental Impact Statement at the same time it is sent to the Council on Environmental Quality.

Sincerely yours,

  
John C. White  
Regional Administrator

Enclosure



# United States Department of the Interior

OFFICE OF THE SECRETARY  
SOUTHWEST REGION

Room 4030, 517 Gold Avenue SW.  
Albuquerque, New Mexico 87101

February 27, 1976

ER-76/14

State Conservationist  
Soil Conservation Service  
U.S. Department of Agriculture  
State Office  
Stillwater, Oklahoma 74074

Dear Sir:

This responds to your letter of December 22, 1975, addressed to Director, Office of Environmental Project Review, requesting our review and comments on your Draft Watershed Work Plan and Environmental Impact Statement, McKinney - Buzzard Creek Watershed, McCurtain County, Oklahoma.

The plan and statement have considered water resource development items such as water quality, hydrology, conservation, stream modification, pesticides, and environmental protection. However, we find that discussions on the geology and fish and wildlife resources of the project area have not been adequately represented.

The following comments are made to clarify and better present the environmental impacts of the proposed project.

## WATERSHED WORK PLAN

### General Comments

The beneficial effects derived from the value of increased output of goods and services to users residing in the project region are estimated to be an average annual monetary increase of \$39,700 attributable to flood prevention measures and \$5,600 attributable to land drainage measures (p. 1-16, p. 1-35). We note that 1,500 acres of Type I and II wetlands occur in the watershed. We have not made a detailed field inspection of the project site specifically concerning impacts on wetlands. However, based on our general knowledge of the project area, it would appear that the proposed land drainage measures may result in the loss of wetlands. From a fish and wildlife standpoint, the monetary benefits gained by land drainage measures may not be commensurate with the environmental



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degradation these measures may impose on wetlands. We believe this report should clearly show whether such a loss will occur.

### Specific Comments

Page I-10, paragraph 2.a. Perhaps the wording could be altered for clarification to read, "... Structure will be installed on Buzzard Creek to protect floodplain ..."

Page I-11, paragraph 2.b. Perhaps the wording could be altered for clarification to read, "... appurtenant structures are planned for the McKinney Creek watershed (see project map)."

Page I-11, paragraph 2.c. Explicit plans for the establishment and project-life maintenance of mitigatory strip plantings should be provided for conformance with Watershed Protection Handbook 101.3141.

## ENVIRONMENTAL IMPACT STATEMENT

### General Comments

The environmental impact statement should provide information on foundation conditions at the dam site. In addition, information on the character of borrow material to be used for construction of the earthfill embankment should be provided. Two of the three geologic formations described contain limestone beds (i.e., the Fredericksburg Group and the Washita Group, p. 11-18, par. 4-5 of the EIS), but their relation to the dam and lake was not discussed.

Impacts on ground water by the proposed land drainage should be more explicitly considered (pp. 11-7, 11-27, 11-32). For example, the statement should explain what magnitude of lowering of the water table is planned in areas to be drained and what effect this will have on wells and water supplies having ground water as their source (pp. 11-19, 11-27). Ground water impacts should be considered in the treatment of alternatives (pp. 11-39, 11-40).

Project effects upon wetlands and their associated wildlife resources are not adequately described in this statement. Wetlands totaling 1,500 acres and comprised of seasonally flooded basins and flats and inland fresh meadows, are said to occur in the watershed (p. 11-19). The drainage of about 1,500 acres of land along McKinney Creek is stated on page 11-33. It would appear that the project will result in the loss of wetlands. A clear indication of the acreage of wetlands affected and a discussion of the effects on fish and wildlife values should be included.

Additionally, rights-of-way requirements for excavation, soil spreading, roads, and maintenance, that are to be provided in the form of rights-of-way maps to sponsors, should also be disclosed in



documents relating to environmental impact. Mitigation, inadequately defined, should be explicitly detailed and assured.

### Specific Comments

Page II-8, last paragraph. The watershed acreage provided under the section on Physical Resources, page II-16, should be provided either earlier or in conjunction with the statement that the drainage area of the proposed structure will comprise 48 percent of the watershed. Wherever discussed, however, the project relationship and location of the 2,095 acres which drain directly into the Red River should be addressed. Structure capability for flood reduction seems otherwise understated.

Page II-9, sixth paragraph. The dominant vegetative character for the sediment pool and detention pool areas is provided. Similar treatment should be accorded the six acres required for the dam and spillway.

Page II-10, first paragraph. The treatment accorded project channelization is apparently not complete, a partial consequence of simultaneous consideration of the main channel and the laterals. The statement that, "About 5.84 miles of channel work will take place along the natural channel of McKinney Creek.", avoids any discussion of the departure from the natural channel occurring in Reach 1 as depicted on the project map. The function of this southern extremity of the main channel should be carefully explained, as well as a complete discussion of its environmental impacts.

The second sentence of the first paragraph is not clear. This may be due to the failure of recognizing 3,500 feet of natural channel enlargement or realignment associated with Lateral No. 4. This paragraph is reiterated in the work plan and should be clarified in both the plan and statement.

Page II-10, second paragraph. The manner in which the channel will be enlarged without encroachment on existing vegetation should be explained. Construction from one side of the channel should be discussed in conjunction with the comment stated in the second paragraph on page I-23 of the work plan which treats the necessity for maintenance travelways.

Page II-10, last paragraph. The statement that, "The location of the channels on the project map is approximate." requires some elaboration. The extent of required flexibility should be defined, particularly as it may relate to the northern and southern extremities.

Page II-12, first paragraph. Mitigation measures agreed to by the local sponsors are listed. No. 1 states, "Wildlife habitat strip plantings comparable in amount and quality to habitat destroyed by channel construction will be made along McKinney Creek." The species and acreage committed should also be disclosed.

Page II-12, second paragraph. In relation to channel construction and the preservation of habitat, it is stated that, "... as many mast-bearing or other large trees as possible will be left.", and that, "A biologist and a forester should flag the trees to be saved." This is a good suggestion, but the statement is non-committal. The assignment of responsibility should be included.

It is further stated that, "... about three acres of habitat plantings for quail and rabbits will be made around the periphery of the reservoir dam and spillway." Plant species of benefit to the game species favored should be disclosed. Also, fencing for exclusion of uncontrolled grazing of the habitat plantings should be provided and assured.

Page II-16, last paragraph. Doesn't the McKinney Creek depression extend southeastward rather than southwestward as stated in this paragraph?

Page II-19, fourth paragraph. The wetland areas referred to in this paragraph should also be appropriately discussed in the section entitled Fish and Wildlife Resources.

Pages II-19 and 29. Each page has a statement similar to the following: "... there has been no known testing for water quality. The water is of good quality ..." Perhaps the statement should be qualified to say, "... the water is considered to be of good quality."

Page II-22, third paragraph. The statement that wildlife populations in the drainage area above the floodwater retarding structure are lower than carrying capacity is questioned. Perhaps some substantiating documentation of this is in order.

Page II-23, section 6. Archeological, Historical, and Unique Scenic Resources. The number of archeological sites in the project area is somewhat confusing. Page II-2, Item 14, mentions five archeological sites. Page II-11, last paragraph mentions three archeological sites. The section on this page mentions four archeological sites. The use of a summary table would help clarify the use of different numbers at different places.

Page II-33, fifth paragraph. The statement that, "The lake may also provide a new high quality fish habitat if managed properly." lacks the conviction implied elsewhere in the statement. It is stated without condition on page II-5, that the sediment pool will be managed under the, "... going and accelerated programs in conjunction with the Oklahoma Department of Wildlife Conservation." If assured management is determined, the program should be described.

Page II-34, first paragraph. The statement that channelization of McKinney Creek may result in this stream being converted from ephemeral to intermittent is not clear. The statement should be better explained or deleted.

Page II-34, second paragraph. It is stated that a reduction in flooding will improve the water quality of McKinney Lake. Apparently the severe erosion that may develop in the silty sand reach discussed on page II-10 was not considered. Also, the prevailing drainage to McKinney Lake should be described and present flows contrasted with flows that may result from project implementation.

Page II-34, third paragraph. The loss of 375 acres of woodlands to agriculture is an adverse impact to wildlife resources. The exchange of acres of woodlands for acres of agricultural production does not improve wildlife habitat. Further, it is not likely that the wildlife carrying capacities will be increased in the vicinity of the remaining cover due to a greater and more constant food supply.

Page II-39, Alternatives 2 and 3. Based on Table 1 on page I-25 of the work plan, these alternatives do not appear to have included any costs for administration, land rights, water rights, or others. These costs would seem to be appropriately charged to alternates and would make the alternates even less desirable.

We hope these comments will be helpful in preparing the final documents.

Sincerely,

A handwritten signature in dark ink, appearing to read "Willard Lewis", written in a cursive style.

Willard Lewis  
Special Assistant to the Secretary



Advisory Council  
On Historic Preservation

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1522 K Street N.W.  
Washington, D.C. 20005

January 12, 1976

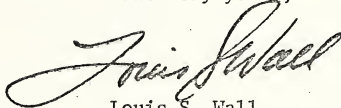
Mr. Roland R. Willis  
State Conservationist  
Soil Conservation Service  
U. S. Department of Agriculture  
State Office  
Stillwater, Oklahoma 74074

Dear Mr. Willis:

This is in response to your request of December 22, 1975 for comments on the draft environmental statement and watershed work plan for the McKinney-Buzzard Creek Watershed, McCurtain County, Oklahoma. The Advisory Council notes from its review of these documents that the Soil Conservation Service (SCS) has determined that the proposed project will not affect archeological and historical resources which are included in or which may be eligible for inclusion in the National Register of Historic Places. We note further that the Oklahoma State Historic Preservation Officer has concurred in this determination, with respect to historic resources. Therefore, we suggest that the final environmental statement demonstrate his concurrence with respect to archeological resources as well.

Should you have questions or require additional assistance in this matter, please contact Michael H. Bureman at (303) 234-4946.

Sincerely yours,



Louis S. Wall  
Assistant Director, Office  
of Review and Compliance



## OKLAHOMA HISTORICAL SOCIETY

Historical Building  
Oklahoma City, Oklahoma 73105  
Historic Sites

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June 19, 1975

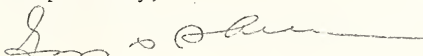
Mr. Hampton Burns  
State Conservationist  
U.S. Dept. of Agriculture  
Soil Conservation Service  
State Office,  
Stillwater, Oklahoma 74074

Dear Mr. Burns:

There appears to be no listed Historic Sites in the area affected by the McKinney-Buzzard Creek watershed project, McCurtain County, Oklahoma .

This office has no objection to the implementation of this project.

Respectfully,



George Shirk  
State Historic Preservation Officer

cc: J.Wettengel  
C.E. Metcalf  
Larry Neal





OKLAHOMA HISTORICAL SOCIETY

Historical Building  
Oklahoma City, Oklahoma 73105

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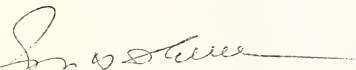
December 29, 1975

Roland R. Willis  
State Conservationist  
U.S. Department of Agriculture  
Soil Conservation Service  
State Office  
Stillwater, Oklahoma 74074

Dear Mr. Willis:

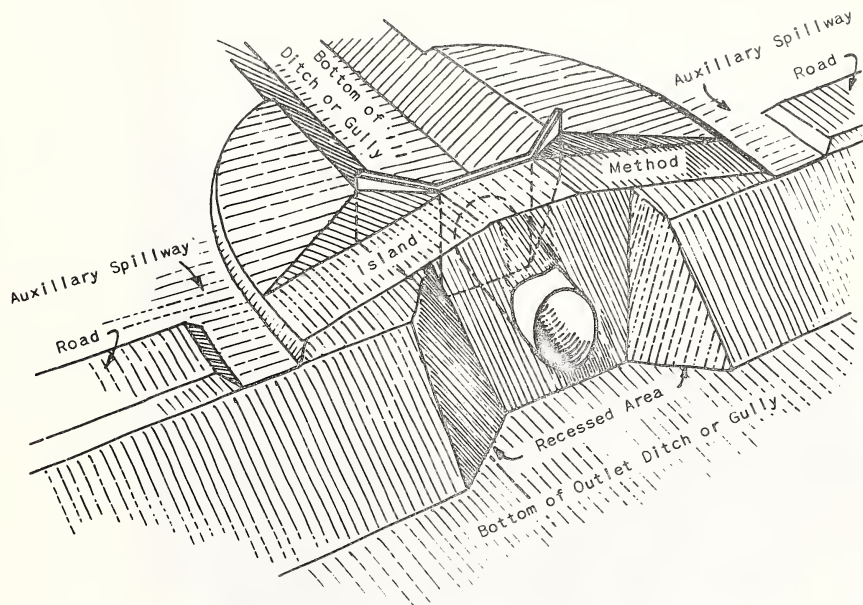
Please refer to my letter of June 19, 1975, to Hampton Burns in regard to the McKinney-Buzzard Creek Watershed, Oklahoma. If you require any further answer in the matter, please specify.

Sincerely,

  
George H. Shirk  
State Preservation Officer



APPENDIX D



TYPICAL PIPE DROP STRUCTURE

















